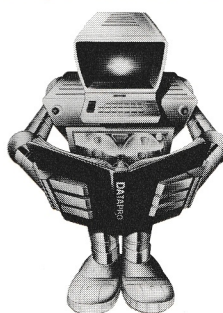


A Datapro Feature Report

**All About Alphanumeric
Display Terminals**



When computer-minded
people want to know what's new
they check with us.



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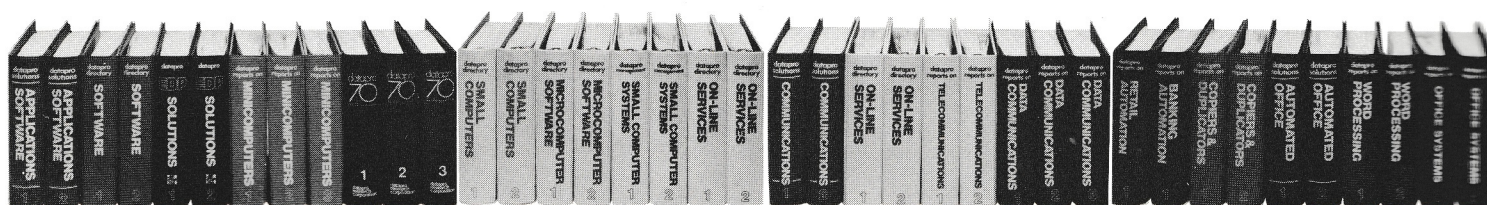
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This report is one of several hundred such reports on data processing and office system hardware, software, services and companies that make up the authoritative Datapro volumes. These volumes are an integral part of each of Datapro's four-part information services for EDP and office professionals. The other service components, subscribed to on an annual basis, include monthly supplements to the volumes, monthly interpretive newsletters, and Custom Consulting with our analysts. Completely independent in its research and evaluations, Datapro publishes the most widely used EDP reference and information services.

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Alphanumeric Display Terminals

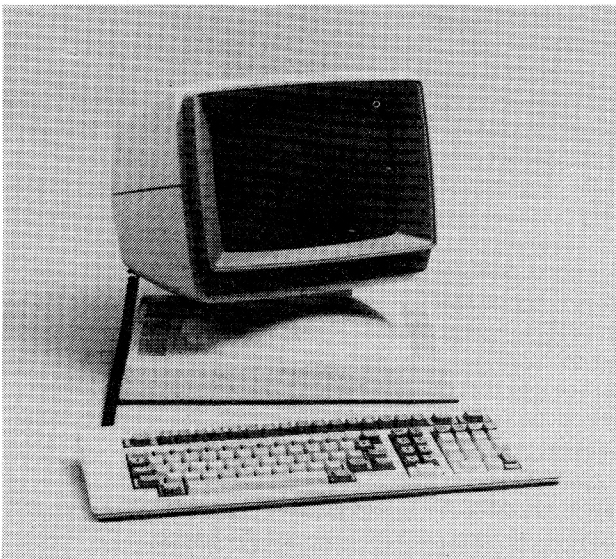
▷ any activity dealing with the interactions between man and his total working environment, plus such traditional and environmental aspects as atmosphere, heat, light, and sound, as well as of tools and equipment of the workplace."

Display terminal manufacturers have become increasingly aware of the need to consider human factors, or ergonomics, in the design of their equipment. The trend toward making CRTs more "operator-friendly" began in Europe, particularly the Scandinavian countries, where powerful unions representing clerical workers have implemented rigid guidelines as to what types of display terminals their members will use.

While no such guidelines are currently in effect in the United States, many CRT manufacturers are beginning to recognize market opportunities in ergonomic designs, and are appealing to the user through marketing campaigns emphasizing the human factors which influenced the design of their terminals.

The average operator of a display terminal is concerned primarily with two components with which he or she has the most interaction; the keyboard, for input of data, and the display screen, for verifying what was keyed and for reading the output data. Ergonomic design improvements are therefore concentrated on these two components.

The majority of display terminal vendors now offer keyboards that are detached or detachable. Connected to the display console via a cable or coiled wire, these keyboards may be placed at some distance (usually 3 to 6 feet) from the console, allowing the operator to place the keyboard in the most comfortable position(s) while working at the terminal.



Lear Siegler's ADM 24E is a smart terminal that incorporates the company's new High Touch ergonomic design. The ADM 24E features a tilt and swivel console, and a low-profile keyboard that conforms to the DIN standard for ergonomics. Lear Siegler, the originator of the "dumb terminal" nomenclature, has historically been a leader in the alphanumeric display terminal market.

The layout of the keyboard is also a concern. Most keyboards feature a typewriter-style layout, for ease of training personnel already familiar with a typewriter's key arrangement. Dedicated (separate) numeric keypads are also generally available, duplicating the key arrangement of a pocket calculator or adding machine, for fast numeric entry. In addition, some vendors have added a palm rest for the numeric pad, for operator comfort. Many vendors also offer sculptured key caps in place of flat key caps, to facilitate speed of data entry and improve operator comfort. For keyboard feedback, vendors may offer either audible or tactile (touch-sensitive) key click, which tells the operator that the key has been depressed far enough to register.

Another important design factor to be considered is the slope and thickness of the keyboard assembly itself. Most keyboards manufactured today are either sloped or stepped, and the optimum profile angle is generally believed to be between 5 and 15 degrees. It has also been determined in studies that the thickness of the keyboard, or the distance from the base of the keyboard to the home row of keys, generally should not exceed 30 mm.

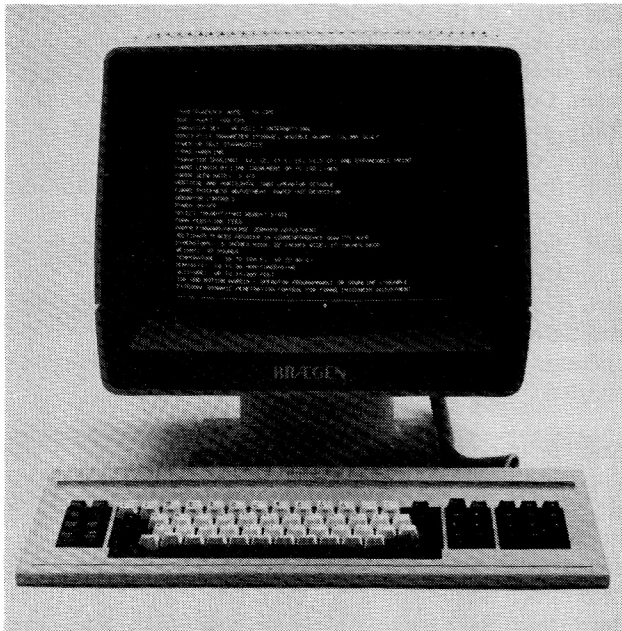
Operator eye strain or fatigue is a consideration which must be dealt with when designing a CRT display screen. Most display screens produced today are etched or contain a bonded faceplate to reduce glare. Another method of glare reduction being utilized by more and more manufacturers is the addition of tilt and/or swivel adjustments. These adjustments not only allow the operator to place the viewing area in a position to avoid glare, but also to place the screen at the most comfortable viewing angle.

The phosphor color and size of characters also contributes to their legibility. White or green phosphor characters are generally used in the United States; green phosphor characters are becoming increasingly popular, and in Europe they are considered easier on the eyes than the standard white. Amber phosphors are also used in Europe, and some domestic vendors who also have large European markets are beginning to offer amber phosphor characters in this country. The vast majority of display terminals on the market today utilize the dot matrix technique to form characters. The more dots that are contained in the character cell, the sharper the character will appear. For years, 5 x 7 characters were the standard of the industry; today, 7 x 7 and 7 x 9 characters are more common, and they provide a clearer character. Some vendors have incorporated higher refresh rates to reduce image instability, or flicker, in the characters, further improving their legibility.

The size of the characters generated depends on the size of the screen and the display format used. Characters will be larger on 15-inch (diagonally measured) screens than on 12-inch screens; likewise, characters will be larger in an 80 character-per-line format than in a 132 character-per-line format. Display enhancements such as double-height and double-width characters can alleviate this problem, but are generally included to highlight significant data, not for general usage.

▷

Alphanumeric Display Terminals



Braegen's new 8500 Series is a family of IBM 3270-compatible controller/terminal systems that provide support for up to 120 peripheral devices from one controller. The series communicates over Braegen's local area network—each controller can support two local area networks of up to 60 devices each. The 8521 Display Station, pictured above, is a member of the 8500 series. The 8521 is compatible with the IBM 3278 Model 2, and includes a 15-inch tilt/swivel screen.

- To facilitate specialized data entry, some vendors offer a light-pen option, which allows the user to enter data via a light-pen for applications involving menu selection. A variation of this is the touch-sensitive screen, offered by a small number of vendors, which allows the user to input data by touching the screen with a finger or a pen. Finally, LSI circuitry has contributed to the use of smaller power supplies. Some CRT terminals have smaller cooling fans than before, resulting in reduced noise level. Individually, these improvements may be slight, but when considered cumulatively, they represent a vast improvement over the terminals of say, five years ago.

All of the above features should merit serious consideration from potential terminal buyers. Although many ergonomic features may be ordered from the terminal manufacturer, the increased emphasis of ergonomics has led to the springing up of a number of specialty companies that offer devices which can be *added* to terminals to make them more user-friendly. Several companies market optical display filters, glare shields, noise shields, etc., which are designed to fit most major displays. Modular office furniture manufacturers also offer work stations that provide tilt/swivel bases for terminals not equipped with these features.

As user awareness of human factors grows, we see ergonomic considerations in the U.S. becoming not simply a market opportunity, but a mandate. Controversy continues to grow regarding the effects that constant use of a CRT has on the health of the operator. Workers whose jobs require

that they sit at the display all day have complained of headaches, dizziness, back pains, and nausea. The National Institute for Occupational Safety and Health (NIOSH) has conducted research studies on this subject (copies of these reports can be obtained from NIOSH). While no definite conclusions have as yet resulted from these studies, it is clear that these concerns are now a significant matter that must be addressed by both vendors and buyers.

MAJOR DISPLAY MARKETS

The alphanumeric display terminal market is generally acknowledged to contain two major segments: the ASCII (asynchronous) terminal market, and the IBM 3270 (synchronous) terminal replacement market. Both segments continue to enjoy healthy growth, particularly the ASCII market. And, as mentioned previously, low prices and increased price/performance have made display terminals more attractive than ever to potential users, and continue to play a major role in the direction of each of these segments.

IBM's Best-Seller, the 3270

The IBM 3270 has strongly impacted the alphanumeric display terminal market since deliveries began late in 1971. The first generation of devices, which were discontinued as IBM products in late 1982, included the 3271/3272 control units, 3275 display station, 3277 display, and 3284/3286/3288 printers. In 1977, the product line was radically overhauled, resulting in the announcement of a second generation of components (the 3274 control unit, 3276 control/display, 3278 display, and 3287/3289 printers) that offered increased capabilities at prices much lower than comparable older models. Along with that announcement came major price reductions on the older equipment. In late 1979, color displays and printers were added to the family.

In March 1983, IBM made some long-awaited changes and enhancements to the 3270 product line. Unveiled were: the 3178 Display Station, a smaller and less expensive version of the popular 3278 Model 2 display; new versions of the 3274 Control Unit, offering improved price/performance; the 3290 Information Panel, a gas plasma display; the 3299 Terminal Multiplexer, a coaxial cable eliminator; price reductions of approximately 10% on older existing 3270 models; purchase discounts of 40% on the 3178 for quantities of 3,000 or more, with the conversion of leased 3278s applying to that quantity; and perhaps most significant, an option permitting the attachment of the IBM Personal Computer to the 3278 Display Station.

These changes were presumably made by IBM to put pressure on their competition, the independent 3270-compatible vendors. These independent vendors, through lower prices or improved price/performance, were eroding IBM's share of the market, which is a very profitable one for the industry giant. In order to remain competitive, these vendors have been forced to reply to the IBM announcements with new products and/or price reductions of their own. For instance, Harris, Telex, and ITT Courier have

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TABLE 1. IBM 3270 COMPATIBILITY

Vendor	System/Model	IBM Controllers Emulated	IBM Displays Emulated	Personal Computing Capability
Beehive	DM 3270/DM 78	—	3276/3278	No
Braegen	8500	3274	3278	Yes
Carterfone	7276	—	3276	No
Computer Communications	Group 8000	3274	3276/3278	No
Control Concepts	EM 3276/CC-3276	—	3276	No
Datamedia	3270-S/3270-6/3270-8	—	3275/3276/3278	No
Harris	8000	3271/3272	3277	No
Harris	9200	3274	3278/3279/3178	Yes
Icot	700/701	—	3278	No
Informer	370	3271/3274	3275/3277/3278	No
C. Itoh (ACM)	CIE-7800	—	3278/3178	No
ITT Courier	270	3271/3272/3274	3275/3276/3277/3278/3279/3178	Yes
Lee Data	Series 300/400	3274	3278/3279	Yes
MDS Trivex	Plus 70	3271/3272	3275/3277	No
MDS Trivex	Plus 80	3274	3278	No
Memorex	1377	—	3277-2	No
Memorex	2076/2078/2079	—	3276/3278/3279	No
Northern Telecom	290	3272/3274	3276/3277	No
Paradyne	9476/9478	—	3276/3278	Yes
Phaze	P3278/P9010	—	3278/3178	Yes
Racal-Milgo	4270 Series	3274	3276/3278	No
Raytheon	PTS-100	3271/3274	3277/3278	No
Raytheon	PTS-2000	3274	3276/3278/3279	No
Raytheon	PTS-1000/PTS-4000	3274	3278/3279/3178	No
Teletype	4540	3271/3272/3274	3275/3276/3277/3278	No
Teletype	5540	3274/3276	3278/3178	No
Telex	270	3274	3276/3278/3279/3178	Yes

► expanded their 3270 product lines by adding 3178-compatible models (interestingly, Telex beat IBM to the punch with its 178 Display Station, introduced in early 1982). Others have adjusted their prices on existing equipment to meet IBM's challenge, for example, by reducing prices on their 3278-compatible terminals and offering them as full-size alternatives to the 3178.

In adding Personal Computer attachability to the 3270 system, IBM has addressed a threat which is as much internal as it is competitive. The overwhelming acceptance and popularity of the IBM Personal Computer poses a real threat to the entire display terminal industry. As personal computing becomes the rule, and not the exception, in most major corporations, IBM is moving to protect its huge 3270 installed base by incorporating personal computing into the 3270 system. Many of the independents now offer some type of personal computing with their product lines, either via their own equipment (Harris, Lee Data, Telex), or through IBM Personal Computer attachability (ITT Courier, Phaze). In the near future, some type of personal computing capability is likely to become requisite for competing in this market.

With the increased pressure from IBM, it is now more important than ever for the independent vendors to offer a complete line of 3270-compatible products. Today's successful independents must couple a full range of products with lower prices, improved price/performance, and shorter delivery times in order to create an opportunity to penetrate an IBM shop. International Data Corporation, a market research firm located in Framingham, Massachusetts, estimates the installed base of IBM 3270 and plug-compatible terminals at 31% of the total U.S. installed

terminal base of over 6.6 million. Clearly, even a small percentage of this market can be extremely profitable for an independent vendor.

In addition to the 3270-compatible vendors, some ASCII terminal vendors have invaded the 3270 market through protocol conversion. On a 3270 network, synchronous terminals can be replaced with asynchronous terminals coupled with protocol converters. These devices allow the ASCII terminal to support the functional characteristics of the 3270 terminal. The advantage of this strategy is obvious—ASCII terminals are considerably less expensive than their 3270 counterparts.

Table 1 provides a summary of the major 3270-compatible vendors and their products. This table contains information on all IBM 3270 components, including the first generation equipment. Although these models are no longer offered by IBM, some independent vendors still offer compatible models, due to the sheer number of these components still in use.

The ASCII Terminal Market

The ASCII display terminal market is the largest segment of the two major display markets, with regard to number of vendors, number of units marketed, and quantity sold. This market originated as the Teletype replacement market, with units intended to replace the highly popular Teletype ASR 33/35 terminals. Although today not many of the ASCII terminals purchased are actually replacing the older Teletype units, the ASCII terminal market is still often referred to as the Teletype-compatible market. ►

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- Manufacturers of ASCII terminals generally aim their products at educational and commercial users requiring large numbers of low-priced terminals for applications such as order entry and time-sharing.

As was mentioned earlier in this report, price is a key factor for success in this market. The current price war involving the low-end entries in the ASCII terminal market has made the recent activity in this segment even greater than in the past. Initially, only the truly "dumb" terminals (like the original dumb unit, the Lear Siegler ADM 3) were available for less than \$1,000. Now, features such as block mode transmission and editing capabilities are available at below traditional dumb terminal prices. In addition to price cutting, vendors are attempting to make their offerings more attractive to potential buyers by adding enhanced features such as business graphics, split screens or windowing, and a variety of visual attributes. ASCII terminal vendors are also paying a lot of attention to ergonomics.

Leaders in the ASCII field generally provide a full range of terminal models ranging from low-end units to editing models. The current leaders include ADDS, Esprit Systems, Lear Siegler, and TeleVideo. An active, but somewhat separate subsection of the ASCII terminal market consists of the Digital Equipment Corporation (DEC) VT100 and those terminals that offer VT100 (or VT52) emulation. The VT100 emulators differ from the other major ASCII terminals mainly in that they offer 132-column display capability.

The success story of Sunnyvale, California-based TeleVideo Systems is worth noting here. The company, which began first commercial deliveries of its Model 912 and 920 smart terminals in March 1979, is currently the leader in



In September 1983, Liberty Electronics cut the single-quantity price tag of its Freedom 100 smart terminal to \$495, becoming the price leader in the low-end ASCII terminal market. The Freedom 100 boasts smart terminal features including editing, visual attributes, and emulation of units from ADDS, Esprit Systems, Lear Siegler, and TeleVideo.

ASCII terminal shipments. TeleVideo's success in this field has encouraged a number of firms to enter the display terminal market, hoping to emulate that success (though not necessarily by following TeleVideo's blueprint), such as Falco Data Products, Liberty Electronics, Qume, Tandberg Data, and Wyse Technology.

USER EXPERIENCE

Datapro is proud to present the 1983 edition of our Terminal Users Survey. The survey is based on results received from questionnaires mailed to a cross-section of *Data Communications* magazine subscribers.

Survey Methodology

A questionnaire was designed and produced by Datapro and mailed by *Data Communications* personnel in July 1983 to approximately 10,000 addresses selected at random from a cross-section of *Data Communications*' U.S. end-user subscriber base.

The questionnaire contained 36 questions, and was divided into five basic parts. In the first four parts, the users were asked to specify within each of four given categories the types of terminals and terminal systems being used in their networks, and to provide usage information and equipment ratings on each type. The four categories included: display terminals, cluster controllers, teleprinter terminals, and RJE and batch terminals. The questionnaire allowed the user to rate up to two vendor/model types within each category of equipment. (Reproduction of the form was permitted when more than two types within given product category were being used.) User ratings given on any programmable models within each category are shown in Tables 1 and 2 of this report. In the fifth part, the users were asked to provide information concerning the general characteristics of their data communications networks.

When Datapro received the returns, they were audited by our senior level editors. All forms were carefully examined for validity before being sent for tabulation. The *Data Communications* labels were used for initial validation and identification. Responses to specific questionnaire sections or individual questions were disqualified whenever a vendor/model identity was omitted, user ratings were not assigned, a vested interest on the part of the respondent was judged to exist or incomprehensible or unreasonable answers were given.

By the editorial cut-off of August 12, 1983, Datapro had processed 404 valid forms, which were then shipped to Mathematica Policy Research, Inc. for key entry and tabulation by computer. Summary information was prepared in the form of totals, percentages, or weighted averages, as appropriate for each question. Weighted averages were computed in a manner similar to most college grading systems: "Excellent" is weighted as 4, "Good" as 3, "Fair" as 2, and "Poor" as 1. The tallied numbers for each value were then multiplied by the corresponding weight, and the average taken by dividing the sum of the products by the total number of responses for that category.

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▷ Datapro suggests that the reader use the information presented with discretion. The individual equipment ratings are not presented to readers as the major consideration in making an acquisition decision. Rather, the ratings and other information should be used as guides to potential strengths and weaknesses that may call for further investigation in selecting the most suitable equipment for your needs.

The Results

The first four parts of the questionnaire focused on specific categories of terminals and terminal systems. Users were asked to list the specific vendors and types of equipment they are using in their networks, and to provide user ratings based on their experiences with each. Two of the sections were utilized to provide a summary of user experience for this report.

The Display Terminal section of the questionnaire asked the users to provide the manufacturers and model numbers of each type of display currently in use, the number of units installed, and ratings of seven specific categories of user experience: overall performance, ease of operation, display clarity, keyboard feel and usability, ergonomics, hardware reliability, and manufacturer's maintenance service/technical support. The users were also asked whether they would recommend the terminal specified to another user. A summary of the results of these questions for all non-programmable display terminal models is shown in Table 2.

The Cluster Controller section of the questionnaire asked the user to provide the manufacturers and model numbers of each type of cluster controller (or clustered terminal system) currently in use, the number of cluster controllers installed, and ratings for seven specific categories of user experience: overall performance, ease of installation, ease of operation, ease of expansion, reliability of controller, reliability of peripherals, and manufacturers' maintenance service/technical support. The users were also asked whether they would recommend the Controller or system specified to another user. A summary of the results obtained for this section is shown in Table 3.

The fifth part of the Terminal Users Survey consisted of ten questions that solicited information on the general characteristics of the users' networks. Taken together, the results provide a brief summary of the extent and complexity of these users' network configurations. Note that some users did not answer every question, resulting in minor variations in the total number of responses to the questions.

First, users were asked to indicate the number of separate locations that are linked by their networks, with the following results:

	Number of Responses	Percent of Responses
1 to 3 locations	117	30
4 to 10 locations	74	19
11 to 25 locations	60	16
26 to 50 locations	38	10
Over 50 locations	95	25
	<hr/> 384	<hr/> 100

These results present a fairly even spread of network sizes, with half the users in the 1-to-10 site range, and the other half in the 10-and-over range. Note that no distinction is made here as to the type or intelligence of the devices installed at any location.

The second question asked the number of computers participating as hosts. As you can see, nearly 70 percent of these users are operating in multiple-host environments:

	Number of Responses	Percent of Responses
1 host	122	31
2 to 4 hosts	181	47
5 to 10 hosts	42	11
Over 10 hosts	41	11
	<hr/> 386	<hr/> 100

This adds some degree of clarity to the responses to Question 1, as well as developing a better picture of the level of sophistication of these users.

The users were also asked to indicate the total number of end-user terminals that are in use on their networks:

	Number of Responses	Percent of Responses
1 to 10 terminals	46	12
11 to 25 terminals	42	11
26 to 100 terminals	86	22
100 to 500 terminals	126	33
Over 500 terminals	84	22
	<hr/> 384	<hr/> 100

When examined in conjunction with Questions 1 and 2, these results characterize the typical respondent to the survey as having a network configuration consisting of approximately 10 sites, two to four hosts, and several hundred terminals.

We then asked the users to indicate for what types of applications these terminals were being used *now*; and what types of new applications the respondents expected to implement within the next two years. The results follow: ▷

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TABLE 2. USER RATINGS OF ALPHANUMERIC DISPLAY TERMINALS

Manufacturer and Model	No. of Responses	No. Displays Installed	Overall Performance					Ease of Operation					Display Clarity					Keyboard Feel & Usability				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
ADDS—																						
Regent	9	561	3.1	4	3	1	1	3.2	2	7	0	0	2.7	1	5	2	1	2.7	0	6	3	0
Regent 25	4	11	3.8	3	1	0	0	3.3	1	3	0	0	2.5	0	2	2	0	2.8	0	3	1	0
Viewpoint	13	172	3.3	5	7	1	0	3.1	2	8	2	0	3.1	3	8	2	0	2.9	3	6	4	0
Viewpoint 90	4	33	4.0	4	0	0	0	3.0	0	4	0	0	3.0	0	4	0	0	3.0	0	4	0	0
Others & unspecified	7	469	3.3	3	3	1	0	3.0	1	5	1	0	2.8	0	2	4	1	2.8	0	6	1	0
Subtotals	37	1246	3.4	19	14	3	1	3.1	7	27	3	0	2.9	5	23	8	1	2.8	3	25	9	0
Beehive—																						
all models	6	246	3.4	2	3	0	0	3.3	3	2	1	0	3.3	2	4	0	0	3.0	2	2	2	0
Burroughs—																						
TD 830	7	581	3.9	6	1	0	0	3.1	4	1	1	1	3.3	2	4	0	0	3.0	1	4	1	0
MT983/985	12	787	3.4	5	4	1	0	3.2	3	8	1	0	2.9	4	4	3	1	2.7	2	6	1	2
SR 110	3	75	3.5	1	1	0	0	3.0	0	3	0	0	3.0	0	3	0	0	3.0	0	3	0	0
Others & unspecified	6	123	3.5	3	3	0	0	3.0	1	4	1	0	2.8	1	3	2	0	2.5	1	2	2	1
Subtotals	28	1,566	3.6	15	9	1	0	3.1	8	16	3	1	3.0	7	14	5	1	2.8	4	15	4	3
CIE Terminals—																						
all models	4	91	3.8	3	1	0	0	3.8	3	1	0	0	3.3	2	0	1	0	3.3	2	0	1	0
Datamedia—																						
Excel	5	17	3.4	3	1	1	0	3.0	2	1	2	0	3.4	2	3	0	0	3.2	2	2	1	0
Others & unspecified	4	18	3.3	1	2	0	0	3.5	2	2	0	0	3.3	1	3	0	0	3.3	2	1	1	0
Subtotals	9	35	3.4	4	3	1	0	3.2	4	3	2	0	3.3	3	6	0	0	3.2	4	3	2	0
DEC—																						
VT100	53	12,362	3.7	35	12	2	0	3.4	27	20	3	1	3.4	22	25	4	0	3.2	15	31	6	0
VT101/102	12	228	3.7	7	4	0	0	3.4	6	6	0	0	3.6	7	5	0	0	3.4	7	4	1	0
VT125	4	74	4.0	3	0	0	0	3.8	3	1	0	0	3.8	3	1	0	0	3.5	2	2	0	0
Others & unspecified	4	376	3.8	3	1	0	0	3.3	1	3	0	0	3.3	2	1	1	0	2.8	1	1	2	0
Subtotals	73	13,040	3.7	48	17	2	0	3.5	37	30	3	1	3.4	34	32	5	0	3.2	25	38	9	1
Data General—																						
D200	5	90	2.7	1	1	0	1	2.8	1	2	2	0	3.4	3	1	1	0	2.6	1	2	1	1
D400/450	5	200	3.6	3	2	0	0	3.8	4	1	0	0	3.6	4	0	1	0	3.0	2	1	2	0
D2	5	169	3.6	3	2	0	0	3.0	1	3	1	0	3.2	2	2	1	0	2.8	0	4	1	0
Subtotals	15	459	3.4	7	5	0	1	3.2	6	6	3	0	3.4	9	3	3	0	2.8	3	7	4	1
Datamaxx—																						
all models	4	24	3.3	1	3	0	0	3.3	1	3	0	0	3.0	0	4	0	0	3.3	2	1	1	0
Esprit—																						
Esprit	3	11	3.7	2	1	0	0	3.3	1	2	0	0	3.3	1	2	0	0	3.3	1	2	0	0
1500	8	1,158	2.6	2	2	3	1	2.8	0	6	2	0	3.1	2	5	1	0	2.4	0	4	3	1
Others & unspecified	8	87	3.5	5	2	1	0	3.0	1	6	1	0	3.0	1	6	1	0	2.7	1	4	3	0
Subtotals	19	1,256	3.2	9	5	4	1	3.0	2	14	3	0	3.1	4	13	2	0	2.7	2	10	6	1
GTC—																						
all models	5	56	2.8	2	1	1	1	2.8	2	1	1	1	2.6	0	3	2	0	2.8	2	0	3	0
Harris—																						
8000	4	1,036	2.3	0	1	3	0	2.8	1	1	2	0	2.3	0	1	3	0	2.8	0	3	1	0
9200	4	162	3.5	2	2	0	0	3.5	2	2	0	0	3.5	2	2	0	0	3.5	2	2	0	0
Others & unspecified	3	58	3.0	0	3	0	0	3.3	1	2	0	0	2.7	0	2	1	0	3.3	2	0	1	0
Subtotals	11	1,256	2.9	2	6	3	0	3.2	4	5	2	0	2.8	2	5	4	0	3.2	4	5	2	0
Hewlett-Packard—																						
2621	9	202	3.7	6	3	0	0	3.6	5	4	0	0	3.4	4	5	0	0	3.4	4	5	0	0
2623/2624	6	38	3.7	4	2	0	0	3.7	4	2	0	0	3.8	5	1	0	0	3.7	4	2	0	0
2626	3	125	4.0	3	0	0	0	3.7	2	1	0	0	3.3	1	2	0	0	4.0	3	0	0	0
2648	3	17	4.0	3	0	0	0	3.7	2	1	0	0	3.0	0	3	0	0	4.0	3	0	0	0
Others & unspecified	7	134	3.6	4	3	0	0	3.3	4	1	2	0	3.6	5	1	1	0	3.4	4	2	1	0
Subtotals	28	516	3.7	20	8	0	0	3.5	17	9	2	0	3.5	15	12	1	0	3.6	18	9	1	0
Honeywell—																						
VIP 7200	6	286	3.2	3	1	2	0	3.0	2	2	2	0	3.0	1	4	1	0	2.3	1	1	3	1
VIP, others & unspecified	6	291	3.2	3	2	0	1	3.2	2	3	1	0	3.0	2	3	0	1	3.0	2	2	2	0
Subtotals	12	577	3.2	6	3	2	1	3.1	4	5	3	1	3.0	3	7	1	1	2.7	3	3	5	1
Human Designed Systems—																						
all models	4	19	3.8	3	1	0	0	3.8	3	1	0	0	3.8	3	1	0	0	3.8	3	1	0	0

Weighted Average (WA) is based on assigning a weight of 4 to each user rating of Excellent (E), 3 to Good (G), 2 to Fair (F), and 1 to Poor (P).

Alphanumeric Display Terminals

TABLE 2. USER RATINGS OF ALPHANUMERIC DISPLAY TERMINALS (Continued)

Manufacturer and Model	Ergonomics					Hardware Reliability					Mfr's. Maintenance Service/Technical Support					Would You Recommend This Terminal to Another User?		
	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	Yes	No	Undecided
ADDS—																		
Regent	2.4	0	6	1	2	2.7	1	5	2	1	3.0	2	4	2	0	3	1	4
Regent 25	2.8	0	3	1	0	3.3	1	3	0	0	2.8	0	3	1	0	3	0	0
Viewpoint	3.2	3	8	1	0	2.8	2	6	5	0	2.9	0	3	1	0	9	2	2
Viewpoint 90	3.0	0	4	0	0	2.5	0	2	2	0	2.8	5	3	2	2	3	0	1
Others & unspecified	2.8	1	4	2	0	3.0	3	2	1	1	2.3	0	4	1	1	4	1	1
Subtotals	2.9	4	25	5	2	2.8	7	18	10	2	2.8	7	17	7	3	22	4	8
Beehive—																		
all models	2.3	0	3	2	1	2.7	1	3	1	1	3.0	1	3	1	1	4	1	0
Burroughs—																		
TD 830	3.2	1	4	0	0	2.7	2	1	4	0	3.1	2	4	1	0	5	1	1
MT983/985	2.6	2	3	6	0	2.3	0	3	7	0	2.9	4	3	5	0	6	3	3
SR 110	2.7	0	2	1	0	3.7	2	1	0	0	2.3	1	0	1	0	3	0	0
Others & unspecified	2.5	2	1	1	2	2.8	2	1	3	0	2.5	1	3	0	0	3	2	1
Subtotals	2.7	5	10	8	2	2.7	6	6	14	0	2.8	8	10	7	0	17	6	5
CIE Terminals—																		
all models	3.7	2	1	0	0	3.3	1	2	0	0	3.7	2	1	0	0	3	0	1
Datamedia—																		
Excel	3.4	2	3	0	0	2.8	2	1	1	1	2.8	1	3	0	1	2	1	0
Others & unspecified	3.5	2	2	0	0	3.0	0	3	0	0	3.3	1	3	0	0	4	0	0
Subtotals	3.4	4	5	0	0	2.9	2	4	1	1	3.0	2	6	0	1	6	1	0
DEC—																		
VT100	3.1	12	31	9	0	3.1	11	34	6	1	3.4	24	20	3	1	45	4	2
VT101/102	3.3	3	8	0	0	3.2	5	5	2	0	3.4	7	4	1	0	11	1	0
VT125	3.3	1	3	0	0	3.5	2	2	0	0	3.8	3	1	0	0	4	0	0
Others & unspecified	2.5	1	1	1	1	2.8	1	1	2	0	3.0	0	3	0	0	2	1	0
Subtotals	3.1	17	43	10	1	3.1	19	42	10	1	3.4	34	28	4	1	62	6	2
Data General—																		
D200	2.0	0	1	3	1	2.6	1	1	3	0	2.6	1	2	1	1	4	1	0
D400/450	3.2	1	4	0	0	3.0	0	5	0	0	3.8	4	1	0	0	5	0	0
D2	3.2	3	1	0	1	2.8	1	2	2	0	3.0	1	3	1	0	5	0	0
Subtotals	2.8	4	6	3	2	2.8	2	8	5	0	3.1	6	6	2	1	14	1	0
Datamaxx—																		
all models	3.0	1	2	1	0	4.0	4	0	0	0	3.5	2	2	0	0	3	0	1
Esprit—																		
Esprit	3.0	1	1	1	0	3.0	1	1	1	0	3.5	1	1	0	0	3	0	0
1500	2.0	0	1	6	1	1.6	0	1	3	4	2.3	0	4	2	2	2	4	2
Others & unspecified	2.6	0	5	3	0	2.4	0	5	2	1	2.7	0	5	3	0	3	1	3
Subtotals	2.4	1	7	10	1	2.2	1	7	6	5	2.6	1	10	5	2	8	5	5
GTC—																		
all models	2.0	0	2	1	2	2.0	0	1	3	1	2.0	0	2	1	2	2	3	0
Harris—																		
8000	2.0	0	1	1	1	2.5	0	3	0	1	2.8	1	2	0	1	0	3	1
9200	3.0	0	1	2	1	3.0	0	4	0	0	3.5	2	2	0	0	4	0	0
Others & unspecified	2.0	0	4	0	0	2.7	0	2	1	0	3.3	1	2	0	0	1	1	1
Subtotals	2.4	0	6	3	2	2.7	0	9	1	1	3.2	4	6	0	1	5	4	2
Hewlett-Packard—																		
2621	3.0	2	5	2	0	2.8	1	4	3	0	3.2	4	3	2	0	8	0	0
2623/2624	3.7	3	2	0	1	3.5	4	1	1	0	3.7	4	2	0	0	6	0	0
2626	4.0	3	0	0	0	3.7	2	1	0	0	3.7	2	1	0	0	3	0	0
2648	4.0	3	0	0	0	**	0	1	0	0	3.7	2	1	0	0	3	0	0
Others & unspecified	2.7	1	3	3	0	2.9	3	2	0	2	3.7	4	2	0	1	5	1	1
Subtotals	3.3	12	10	5	1	3.1	10	9	4	2	3.5	16	9	2	1	25	1	1
Honeywell—																		
VIP 7200	2.3	1	1	3	1	2.0	0	3	0	3	2.8	1	4	0	1	2	4	0
VIP, others & unspecified	2.5	1	3	0	2	2.8	1	3	2	0	3.0	2	2	2	0	4	1	1
Subtotals	2.4	2	4	3	3	2.4	1	6	2	3	2.9	3	6	2	1	6	5	1
Human Designed Systems—																		
all models	3.8	3	1	0	0	2.8	1	1	2	0	2.8	1	1	2	0	2	0	2

Weighted Average (WA) is based on assigning a weight of 4 to each user rating of Excellent (E), 3 to Good (G), 2 to Fair (F), and 1 to Poor (P).

Alphanumeric Display Terminals

TABLE 2. USER RATINGS OF ALPHANUMERIC DISPLAY TERMINALS (Continued)

Manufacturer and Model	No. of Responses	No. Displays Installed	Overall Performance					Ease of Operation					Display Clarity					Keyboard Feel & Usability				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
IBM—																						
3101	8	1,540	3.5	4	4	0	0	3.0	2	4	2	0	3.0	2	4	2	0	3.1	3	3	2	0
3178	22	821	3.5	12	7	2	0	3.1	8	9	3	1	3.4	11	8	3	0	3.2	10	8	2	2
3270, unspecified	16	1,639	3.2	3	12	0	0	3.4	8	6	2	0	3.4	7	8	1	0	3.3	6	9	1	0
3276	8	607	3.3	3	4	1	0	3.1	3	4	0	1	3.0	1	5	1	0	3.4	3	5	0	0
3277	12	1,084	3.1	2	9	1	0	2.8	1	7	4	0	2.8	1	7	4	0	2.6	0	8	3	1
3278	129	27,026	3.1	16	100	1	0	3.5	75	49	4	1	3.3	48	69	10	2	3.2	38	76	14	0
3279	45	4,936	3.5	21	20	1	0	3.5	25	18	2	0	3.3	21	18	5	1	3.2	16	24	4	1
5251	10	305	3.1	1	7	0	0	3.7	7	3	0	0	3.5	5	5	0	0	3.2	4	4	2	0
8775	4	276	3.5	2	2	0	0	3.5	2	2	0	0	3.3	1	3	0	0	3.3	1	3	0	0
Others & unspecified	6	148	3.3	2	4	0	0	3.2	1	5	0	0	3.3	3	2	1	0	3.0	2	2	2	0
Subtotals	260	88,382	3.3	66	169	6	0	3.4	132	107	17	3	3.3	100	129	27	3	3.2	83	142	30	4
ITT Courier—																						
270	17	1,846	3.1	2	13	1	1	3.0	4	9	4	0	3.0	5	8	3	1	3.1	5	9	3	0
Lear Siegler—																						
ADM 3/3A	12	355	3.5	7	4	1	0	3.2	3	8	1	0	3.0	2	8	2	0	2.8	3	5	3	1
ADM 5	7	55	3.7	4	2	0	0	3.1	2	4	1	0	3.3	3	3	1	0	2.7	2	2	2	1
ADM 31	7	982	3.6	5	1	1	0	3.0	1	5	1	0	2.9	1	4	2	0	2.7	0	5	2	0
ADM 42	3	41	3.3	1	2	0	0	3.3	1	2	0	0	3.0	0	3	0	0	3.7	2	1	0	0
ADM, others & unspecified	9	103	3.7	6	3	0	0	2.9	1	6	2	0	3.0	2	5	2	0	2.8	1	6	1	1
Subtotals	38	1,536	3.6	23	12	2	1	3.1	8	25	5	0	3.0	8	23	7	0	2.8	8	19	8	3
Lee Data—																						
all models	3	48	3.7	2	1	0	0	3.7	2	1	0	0	3.7	2	1	0	0	3.7	2	1	0	0
MDS Trivex—																						
all models	4	1,446	2.4	0	3	1	1	2.8	1	2	2	0	2.6	0	3	2	0	2.2	1	1	1	2
Memorex—																						
1370	6	332	3.2	1	5	0	0	3.7	4	2	0	0	3.5	3	3	0	0	3.7	4	2	0	0
2078	7	557	3.3	2	4	0	0	3.7	5	2	0	0	3.6	4	3	0	0	3.6	4	3	0	0
Subtotals	13	889	3.3	3	9	0	0	3.7	9	4	0	0	3.5	7	6	0	0	3.6	8	5	0	0
NCR—																						
all models	5	286	3.8	3	1	0	0	3.2	1	4	0	0	3.0	1	3	1	0	2.8	1	2	2	0
Northern Telecom—																						
290	4	238	2.8	0	3	1	0	3.0	0	4	0	0	2.5	0	2	2	0	2.3	0	1	3	0
Olivetti—																						
all models	3	356	3.7	2	1	0	0	3.0	0	3	0	0	3.0	0	3	0	0	3.0	0	3	0	0
Perkin-Elmer—																						
all models	5	359	3.2	1	4	0	0	3.2	1	4	0	0	3.2	1	4	0	0	2.6	0	4	0	1
Racal-Milgo—																						
all models	5	187	3.3	1	3	0	0	3.2	1	4	0	0	3.2	1	4	0	0	3.0	1	3	1	0
Raytheon—																						
all models	6	5,899	3.0	0	4	0	0	3.0	1	4	1	0	3.2	1	5	0	0	2.7	0	4	2	0
TEC—																						
all models	3	31	3.7	2	1	0	0	3.0	0	3	0	0	2.7	1	0	2	0	3.3	2	0	1	0
Telera—																						
all models	5	39	3.4	2	3	0	0	3.2	1	4	0	0	3.0	0	5	0	0	2.8	0	4	1	0
Teletype—																						
40	14	217	3.9	12	1	0	0	3.5	7	7	0	0	3.4	6	8	0	0	3.6	9	5	0	0
4540	12	1,541	3.2	2	10	0	0	3.5	7	4	1	0	3.6	8	3	1	0	3.5	7	4	1	0
Others & unspecified	3	1,204	4.0	3	0	0	0	3.7	2	1	0	0	4.0	3	0	0	0	3.7	2	1	0	0
Subtotals	29	2,962	3.6	17	11	0	0	3.5	16	12	1	0	3.6	17	11	1	0	3.6	18	10	1	0
TeleVideo—																						
910	4	88	3.7	2	1	0	0	3.5	2	2	0	0	3.3	1	3	0	0	3.5	2	2	0	0
920	5	56	3.6	3	2	0	0	3.4	2	3	0	0	3.0	1	3	1	0	3.4	2	3	0	0
925	10	214	3.5	6	3	1	0	3.3	4	5	1	0	3.1	4	3	1	1	3.3	5	2	2	0
950	18	289	3.7	11	5	0	0	3.4	7	11	0	0	3.1	5	11	1	1	3.3	5	13	0	0
Others & unspecified	5	54	4.0	4	0	0	0	3.0	1	3	1	0	3.6	3	2	0	0	3.6	3	2	0	0
Subtotals	42	701	3.7	26	11	1	0	3.3	16	24	2	0	3.2	14	22	3	2	3.4	17	22	2	0

Weighted Average (WA) is based on assigning a weight of 4 to each user rating of Excellent (E), 3 to Good (G), 2 to Fair (F), and 1 to Poor (P).

Alphanumeric Display Terminals

TABLE 2. USER RATINGS OF ALPHANUMERIC DISPLAY TERMINALS (Continued)

Manufacturer and Model	Ergonomics					Hardware Reliability					Mfr's. Maintenance Service/Technical Support					Would You Recommend This Terminal to Another User?		
	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	Yes	No	Undecided
IBM—																		
3101	3.3	3	4	1	0	3.3	3	4	1	0	3.1	3	3	2	0	7	1	0
3178	3.2	9	8	4	0	3.6	14	5	2	0	3.3	10	10	1	1	18	1	2
3270, unspecified	3.1	6	7	1	2	3.1	3	12	0	1	3.4	7	8	1	0	14	1	0
3276	2.4	0	4	3	1	3.4	3	5	0	0	3.5	4	4	0	0	6	1	0
3277	2.5	0	6	4	1	2.3	0	4	7	1	3.0	3	7	1	1	6	5	0
3278	3.1	40	66	18	4	2.8	25	58	34	9	3.6	77	47	4	1	108	8	6
3279	3.1	13	23	8	0	3.3	19	18	5	1	3.5	25	18	2	0	39	3	0
5251	3.3	4	5	1	0	3.2	4	5	0	1	3.9	9	1	0	0	9	0	0
8775	3.0	1	2	1	0	3.3	2	1	1	0	3.5	2	2	0	0	4	0	0
Others & unspecified	3.3	2	4	0	0	3.5	3	3	0	0	3.2	3	1	2	0	6	0	0
Subtotals	3.1	78	129	41	8	3.0	16	115	50	13	3.5	143	101	13	3	217	20	8
ITT Courier—																		
270	2.8	2	9	6	0	2.9	3	9	4	0	2.9	3	10	3	1	12	3	2
Lear Siegler—																		
ADM 3/3A	2.8	1	7	3	1	2.6	1	7	2	2	2.9	1	9	2	0	8	2	2
ADM 5	1.9	0	1	4	2	2.6	2	2	1	2	2.9	1	5	0	1	3	1	3
ADM 31	2.1	0	3	2	2	2.1	1	0	5	1	3.0	2	3	2	0	5	1	1
ADM 42	3.0	0	3	0	0	2.7	0	2	1	0	2.7	1	0	2	0	1	1	1
ADM, others & unspecified	2.7	0	7	1	1	2.6	1	4	2	1	2.9	0	7	1	0	4	1	1
Subtotals	2.5	1	21	10	6	2.5	5	15	11	6	2.9	5	24	7	1	21	6	8
Lee Data—																		
all models	3.7	2	1	0	0	3.7	2	1	0	0	3.3	1	2	0	0	3	0	0
MDS Trivex—																		
all models	2.3	0	1	3	0	1.8	0	1	2	2	2.2	0	3	0	2	2	3	0
Memorex—																		
1370	3.5	3	3	0	0	3.5	3	3	0	0	3.7	4	2	0	0	6	0	0
2078	3.3	2	4	0	0	3.3	2	5	0	0	3.1	3	2	2	0	7	0	0
Subtotals	3.4	5	7	0	0	3.4	5	8	0	0	3.4	7	4	2	0	13	0	0
NCR—																		
all models	3.0	0	5	0	0	2.8	0	4	1	0	3.0	1	3	1	0	5	0	0
Northern Telecom—																		
290	2.5	0	3	0	1	2.0	0	1	2	1	2.0	0	1	2	1	0	3	1
Olivetti—																		
all models	3.0	0	3	0	0	2.7	0	2	1	0	2.7	0	2	1	0	2	0	0
Perkin-Elmer—																		
all models	2.0	0	2	1	2	2.2	0	2	2	1	2.4	0	3	1	1	3	2	0
Racal-Milgo—																		
all models	3.0	1	3	1	0	3.2	1	4	0	0	3.0	1	3	1	0	3	0	2
Raytheon—																		
all models	3.2	1	5	0	0	2.5	0	3	3	0	2.3	0	3	2	1	4	1	1
TEC—																		
all models	2.7	0	2	1	0	2.3	1	0	1	1	2.3	0	2	0	1	1	2	0
Teleray—																		
all models	2.4	0	2	3	0	3.2	1	4	0	0	3.0	2	2	0	1	5	0	0
Teletype—																		
40	3.4	7	5	2	0	3.6	8	6	0	0	3.4	7	6	1	0	11	0	1
4540	3.6	7	5	0	0	3.1	2	9	1	0	3.3	6	5	0	1	10	1	1
Others & unspecified	3.7	2	1	0	0	4.0	3	0	0	0	4.0	3	0	0	0	2	0	0
Subtotals	3.5	16	11	2	0	3.4	13	15	1	0	3.5	16	11	1	1	23	1	2
TeleVideo—																		
910	2.5	0	2	2	0	2.3	0	1	2	0	3.8	3	1	0	0	4	0	0
920	2.8	1	2	2	0	3.0	1	3	1	0	3.0	1	3	1	0	4	0	1
925	2.8	3	3	3	1	2.6	2	3	4	1	2.7	0	7	3	0	7	1	1
950	2.8	4	8	5	1	2.9	5	6	7	0	3.3	8	7	3	0	16	0	2
Others & unspecified	3.4	2	3	0	0	3.0	1	3	1	0	3.2	2	2	1	0	5	0	0
Subtotals	2.9	10	18	12	2	2.8	9	16	15	1	3.1	14	20	8	0	36	1	4

Weighted Average (WA) is based on assigning a weight of 4 to each user rating of Excellent (E), 3 to Good (G), 2 to Fair (F), and 1 to Poor (P).

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TABLE 2. USER RATINGS OF ALPHANUMERIC DISPLAY TERMINALS (Continued)

Manufacturer and Model	No. of Responses	No. Displays In-stall.	Overall Performance					Ease of Operation					Display Clarity					Keyboard Feel & Usability				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Telex—																						
277	7	1,201	3.4	3	4	0	0	2.9	1	4	2	0	2.7	0	5	2	0	2.6	0	4	3	0
278	10	310	3.1	3	4	0	1	2.9	3	4	2	1	3.0	1	8	1	0	2.7	1	6	2	1
270, others & unspecified	3	298	3.3	1	2	0	0	3.3	1	2	0	0	3.0	0	3	0	0	3.0	1	1	1	0
Subtotals	20	1,809	3.3	7	10	0	1	3.0	5	10	4	1	2.9	1	16	3	0	2.7	2	11	6	1
Sperry Univac—																						
UTS 20	5	237	3.6	3	2	0	0	3.6	3	2	0	0	3.4	2	3	0	0	3.4	2	3	0	0
Other & unspecified	3	8	2.7	0	2	1	0	3.7	2	1	0	0	3.0	0	3	0	0	3.7	2	1	0	0
Subtotals	8	245	3.3	3	4	1	0	3.6	5	3	0	0	3.3	2	6	0	0	3.5	4	4	0	0
Visual—																						
all models	8	70	3.8	6	2	0	0	3.5	4	4	0	0	3.4	3	5	0	0	3.5	4	4	0	0
Zenith—																						
Z19/Z29	9	153	3.3	3	3	1	0	3.2	3	5	1	0	3.2	4	3	2	0	2.7	3	1	4	1
All others	31	3,047	3.3	13	14	1	1	3.0	9	13	8	1	3.0	6	19	5	1	3.0	6	18	7	0
GRAND TOTALS	773	30,916	3.4	323	361	32	10	3.3	320	372	71	9	3.2	263	405	90	10	3.1	242	387	121	19

Weighted Average (WA) is based on assigning a weight of 4 to each user rating of Excellent (E), 3 to Good (G), 2 to Fair (F), and 1 to Poor (P).

	Percent of Total Responses				Number of Responses	Percent of Total Responses
	Now	Within 2 years	No plans (or no answers)			
Inquiry/response	85	5	10	Asynchronous	274	70
Program development	83	5	12	IBM BSC	187	47
Interactive/data entry	81	9	10	IBM SDLC	130	33
System console	68	2	30	Other bit-oriented	44	11
Text editing/word processing	56	22	22	synchronous protocol (e.g., ANSI ADCCP, ISO HDLC, Sperry UDLC, or Burroughs BDLC)		
Batch data entry	54	8	38	X.25 packet-level	34	9
Remote job entry	47	11	42	Other byte-oriented	35	9
Intra-company message traffic	43	28	29	synchronous protocol (e.g., DEC DDCMP)		
Distributed processing/local file maintenance	36	29	35	Other	22	6
Business graphics	25	25	50			
Other	4	2	94			

These results reveal the stability of the traditional applications, such as inquiry/response, program development, and interactive data entry, and more interestingly, the projected growth for newer applications, such as word processing, electronic mail, distributed processing, and business graphics. Twenty to thirty of these users are planning to add one or more of these capabilities in the next two years!

The users were also asked to indicate the primary protocols supported by their terminals:

Although we are not in a position to draw any formal conclusions, since this year's user sample consists of different respondents from last year's; some interesting observations can be made when the two years' responses are compared. (The size of the respondent group is approximately the same: 447 respondents in 1982 versus 404 respondents for 1983.) Asynchronous protocol users have increased from 62 percent in 1982 to 70 percent in 1983, indicating an increased use of ASCII terminals, while users of IBM BSC and other byte-oriented protocols has decreased from 65 to 56 percent. One possible explanation may be the increasing use of protocol conversion in IBM environments. (See the responses to the next two questions, on protocol conversion, for corroboration of this conclusion.) The use of IBM SDLC has remained nearly steady—34 percent for 1982 compared to 33 percent for 1983, and

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TABLE 2. USER RATINGS OF ALPHANUMERIC DISPLAY TERMINALS (Continued)

Manufacturer and Model	Ergonomics					Hardware Reliability					Mfr's. Maintenance Service/Technical Support					Would You Recommend This Terminal to Another User?		
	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	Yes	No	Undecided
Telex—																		
277	2.3	0	3	3	1	2.7	2	3	0	2	2.9	0	6	1	0	5	2	0
278	2.5	1	4	4	1	2.7	1	5	4	0	2.9	2	6	1	1	6	2	2
270, others & unspecified	3.0	1	1	1	0	3.0	0	3	0	0	3.3	1	2	0	0	2	0	0
Subtotals	2.5	2	8	8	2	2.8	3	11	4	2	3.0	3	14	2	1	13	4	2
Sperry Univac																		
UTS 20	3.0	1	3	1	0	3.6	3	2	0	0	3.4	3	1	1	0	4	0	0
Others & unspecified	3.0	0	3	0	0	3.0	0	3	0	0	3.3	2	0	1	0	3	0	0
Subtotals	3.0	1	6	1	0	3.4	3	5	0	0	3.4	5	1	2	0	7	0	0
Visual—																		
all models	3.1	2	5	1	0	3.1	2	5	1	0	3.1	2	5	1	0	7	1	0
Zenith—																		
Z19/Z29	2.7	0	6	3	0	3.1	2	6	1	0	3.2	4	3	2	0	7	2	0
All others	2.6	5	12	11	3	2.6	4	13	11	3	2.8	6	13	9	2	18	9	3
GRAND TOTALS	2.9	181	384	155	41	2.9	185	340	170	47	3.2	300	336	91	30	581	94	61

Weighted Average (WA) is based on assigning a weight of 4 to each user rating of Excellent (E), 3 to Good (G), 2 to Fair (F), and 1 to Poor (P).

➤ the high number of users who indicated using multiple protocols in their networks suggests that many of these users are still in various stages of migration to SNA and in no hurry to complete it. While the number of X.25 packet-level users remains small, the percentage has more than doubled since last year, (4 percent in 1982 versus 9 percent in 1983), indicating a steadily growing use of packet switching networks.

We then asked these users to identify any types of protocol conversion that was being performed for their applications:

	Number of Responses	Percent of Total Responses
ASCII-to-BSC	107	27
ASCII-to-SDLC	75	19
BSC-to-SDLC	33	8
Other	27	6

... and by what means this protocol conversion is performed:

	Number of Responses	Percent of Total Responses
Software loaded onto an existing system such as a general-purpose computer, front-end processor, terminal controller, or PBX system	107	27
Dedicated protocol converter	96	24
Value-added network service (e.g., Telenet)	22	6
Other	2	1

The advantages of protocol conversion are many—lower equipment costs, use of a single terminal type for multiple functions, integration of various vendors' equipment into a congruous network, etc. The strength of the protocol conversion market that has emerged in the past two years is certainly confirmed by these users' responses. Although these two questions were new on the 1983 questionnaire, and thus we have no comparative data from last year, the heavy use of ASCII-to-BSC conversion seems to bear out the conclusions concerning the increased use of asynchronous terminals we noted in the preceding question on what protocols are being used in these networks.

	Percent Total Responses		
	Now	Within 2 years	No plans (or no answer)
Traditional point-to-point terminal-to-mainframe connections	79	2	19
Interconnection via cable bus or ring network	18	22	60
Point-to-point switched connections via PBX or data switch	22	19	59
Other	7	1	92

We also asked those users who are currently operating cable bus or ring networks in their organizations to identify them by names: ➤

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TABLE 3. USER RATINGS OF CLUSTERED TERMINAL SYSTEMS/CONTROLLERS—IBM 3270 & COMPATIBLE

Manufacturer and Model	No. of Responses	No. Displays Installed	Overall Performance					Ease of Operation					Display Clarity					Keyboard Feel & Usability				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Datastream— all models	3	4	4.0	3	0	0	0	4.0	3	0	0	0	4.0	3	0	0	0	4.0	3	0	0	0
Harris—																						
8000	6	88	2.2	0	3	1	2	2.2	1	1	2	2	2.2	0	3	1	2	1.7	0	1	2	3
9200	3	3	3.3	1	2	0	0	3.3	1	2	0	0	3.0	0	3	0	0	3.3	1	2	0	0
Subtotals	9	91	2.6	1	5	1	2	2.6	2	3	2	2	2.4	0	6	1	2	2.2	1	3	2	3
IBM—																						
3271	5	9	3.2	1	4	0	0	2.6	0	3	2	0	2.8	0	4	1	0	1.8	0	1	2	2
3272	9	10	3.2	3	5	1	0	3.0	2	5	2	0	3.1	2	6	1	0	3.0	2	5	2	0
3274	156	1,756	3.6	88	66	2	0	3.2	45	93	17	0	3.3	66	78	11	1	3.0	39	75	40	2
3276	57	783	3.6	33	23	1	0	3.4	25	30	2	0	3.4	26	30	1	0	3.0	18	25	12	2
Others & unspecified	6	60	3.2	1	5	0	0	3.4	2	3	0	0	3.5	4	1	1	0	3.0	2	2	2	0
Subtotals	233	2,618	3.5	126	103	4	0	3.2	74	134	23	0	3.4	98	119	15	1	3.0	61	108	58	6
ITT Courier—																						
7411	6	16	2.7	0	5	0	1	3.0	0	6	0	0	3.0	1	4	1	0	3.2	1	5	0	0
7601	4	39	3.5	2	2	0	0	3.7	2	1	0	0	3.5	2	2	0	0	3.5	2	2	0	0
270, others & unspecified	7	16	2.4	1	3	1	2	2.7	1	3	3	0	2.9	2	2	3	0	2.7	2	1	4	0
Subtotals	17	71	2.8	3	10	1	3	3.0	3	10	3	0	3.1	5	8	4	0	3.1	5	8	4	0
Lee Data— all models	3	4	3.3	1	2	0	0	3.7	2	1	0	0	3.7	2	1	0	0	3.7	2	1	0	0
Memorex— all models	4	4	3.3	2	1	1	0	3.3	2	1	1	0	3.3	2	1	1	0	3.3	2	1	1	0
Northern Telecom— 290	3	3	3.0	0	3	0	0	2.7	1	1	0	1	3.0	1	1	1	0	2.7	0	2	1	0
Racal-Milgo— 4270	3	36	3.0	1	2	0	0	3.0	1	1	1	0	3.3	1	2	0	0	3.3	1	2	0	0
Raytheon— all models	8	104	2.8	0	7	1	0	2.6	1	4	2	1	3.0	0	8	0	0	2.9	1	5	0	1
Telex—																						
271	5	23	3.0	1	3	1	0	3.4	2	3	0	0	3.0	1	3	1	0	3.2	1	4	0	0
270, others & unspecified	3	7	3.0	0	3	0	0	3.3	1	2	0	0	3.3	1	2	0	0	3.3	1	2	0	0
Subtotals	8	30	3.0	1	6	1	0	3.4	3	5	0	0	3.1	2	5	1	0	3.3	2	6	0	0
Teletype—																						
4540	12	147	3.4	7	3	2	0	3.5	7	4	1	0	3.5	6	6	0	0	3.4	6	5	1	0
Others & unspecified	5	146	3.8	4	1	0	0	3.8	4	1	0	0	3.8	4	1	0	0	4.0	5	0	0	0
Subtotals	17	293	3.5	11	4	2	0	3.6	11	5	1	0	3.6	10	7	0	0	3.6	11	5	1	0
All others	11	141	3.3	5	4	2	0	3.1	3	6	2	0	3.3	4	6	1	0	3.0	3	5	3	0
GRAND TOTALS	319	3,459	3.4	154	147	13	5	3.2	106	171	35	4	3.3	128	164	24	3	3.0	92	146	70	10

Weighted Average (WA) is based on assigning a weight of 4 to each user rating of Excellent (E), 3 to Good (G), 2 to Fair (F), and 1 to Poor (P).

➤ We then requested information on the types of local networks these users have operating *now*, and what types they plan to install *within the next two years*.

	Number of Responses	Percent of Total Responses
Ethernet	32	8
IBM 8100 Loop	17	4
Sytek Local Net	10	3
Prime Ringnet	9	2
IBM Series/1	7	2
Datapoint ARCnet	5	1
NSC Hyperchannel	3	1
Other	33	8

The use of cable bus and ring networks is being strongly promoted by the industry, but user acceptance has been slow. Last year's responses showed approximately 13 percent of the users with commercially available local area networks installed: this year's figure is 18 percent. Some users apparently have more than one type of LAN within their organizations, which may explain the difference in the percent of total responses between the first, more general LAN question, in which 71 users (18 percent) indicate that they have some type of cable bus or ring network now, and the second, more specific question, in which 116 LANs are identified. We expect user acceptance of the local area network concept to continue to grow cautiously while this volatile market attempts to find its footing.

The final question in this section of the questionnaire asked how many microcomputers are currently connected to ➤

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TABLE 3. USER RATINGS OF CLUSTERED TERMINAL SYSTEMS/CONTROLLERS—IBM 3270 & COMPATIBLE

Manufacturer and Model	Ergonomics					Hardware Reliability					Mfr's. Maintenance Service/Technical Support					Would You Recommend This Terminal to Another User?		
	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	Yes	No	Undecided
Datastream— all models	4.0	3	0	0	0	—	0	0	0	0	4.0	3	0	0	0	3	0	0
Harris— 8000	2.3	0	3	2	1	2.5	0	4	1	1	2.3	0	4	0	2	0	3	2
9200	3.3	1	2	0	0	3.3	1	2	0	0	3.3	1	2	0	0	3	0	0
Subtotals	2.7	1	5	2	1	2.8	1	6	1	1	2.7	1	6	0	2	3	3	2
IBM																		
3271	3.2	1	4	0	0	2.8	0	4	1	0	3.0	0	5	0	0	1	3	1
3272	3.1	3	4	2	0	3.1	2	5	1	0	2.9	2	4	3	0	6	1	1
3274	3.5	84	68	3	1	3.4	65	77	5	0	3.3	72	66	15	3	142	2	3
3276	3.5	33	22	2	0	3.5	28	23	1	0	3.4	29	22	6	0	50	0	2
Others & unspecified	3.2	3	1	2	0	3.3	3	2	1	0	3.8	5	1	0	0	5	0	0
Subtotals	3.5	124	99	9	1	3.4	98	111	9	0	3.3	108	98	24	3	204	6	7
ITT Courier— 7411	2.7	0	5	0	1	2.7	0	5	0	1	2.8	1	4	0	1	3	1	1
7601	3.5	2	2	0	0	3.5	2	2	0	0	3.3	1	3	0	0	3	0	0
270, others & unspecified	2.3	1	2	2	2	2.7	1	3	3	0	2.7	2	1	4	0	4	2	1
Subtotals	2.7	3	9	2	3	2.9	3	10	3	1	2.9	4	8	4	1	10	3	2
Lee Data— all models	3.3	1	2	0	0	—	1	1	0	0	3.3	1	2	0	0	3	0	0
Memorex— all models	3.0	2	1	0	1	3.3	2	1	1	0	2.8	1	2	0	1	3	1	0
Northern Telecom— 290	2.3	0	1	2	0	1.7	0	1	0	2	2.0	0	1	1	1	2	0	1
Racal-Milgo— 4270	2.7	0	2	1	0	2.7	0	2	1	0	3.0	1	1	1	0	2	1	0
Raytheon— all models	2.7	0	6	0	1	2.7	0	5	2	0	2.5	0	5	2	1	6	1	1
Telex— 271	3.0	1	3	1	0	3.0	0	5	0	0	2.8	0	4	1	0	4	0	1
270, others & unspecified	2.7	0	2	1	0	3.0	0	3	0	0	3.0	0	3	0	0	2	0	1
Subtotals	2.9	1	5	2	0	3.0	0	8	0	0	2.9	0	7	1	0	6	0	2
Teletype— 4540	3.5	8	2	2	0	2.9	4	2	3	1	3.2	6	3	2	1	9	1	1
Others & unspecified	4.0	5	0	0	0	3.8	4	1	0	0	3.8	4	1	0	0	5	0	0
Subtotals	3.7	13	2	2	0	3.2	8	3	3	1	3.4	10	4	2	1	14	1	1
All others	3.1	5	4	0	2	3.0	1	7	1	0	2.7	1	7	2	1	9	0	2
GRAND TOTALS	3.4	153	136	20	9	3.3	114	155	21	5	3.2	130	141	37	11	265	16	18

Weighted Average (WA) is based on assigning a weight of 4 to each user rating of Excellent (E), 3 to Good (G), 2 to Fair (F), and 1 to Poor (P).

these users' networks locally or via dial-up or private telephone lines:

	Number of Responses	Percent of Responses
None	122	33
1 to 10	152	42
10 to 25	39	11
Over 25	51	14

We were surprised at how deeply microcomputers have penetrated these users' organizations. Over two-thirds indicate that they have integrated these devices into their

networks. Once compatibility requirements are met, microcomputer communications capabilities can open up vast new resources to their direct users and the organization at large—use of electronic mail, multifunction terminal emulation, sharing of local hardware, software, and database resources, and access to public on-line data bases and remote computing services are just a few of the benefits. We expect to see even further growth in the number of communicating microcomputers in use in the next edition of this survey.

The Datapro Research staff extends a sincere thanks to all for responding so enthusiastically to our 1983 Terminal Users Survey. Without your participation, it could not

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➤ have been the success it is, and we hope that this compendium of user experience will be of significant value to you. We look forward to hearing from you again.

DISPLAY TERMINAL CHARACTERISTICS

The accompanying comparison charts summarize the characteristics of 321 commercially available alphanumeric display terminals from 92 vendors. Nearly all of the information was supplied by the manufacturers during the months of September and October 1983. Their cooperation is acknowledged and greatly appreciated.

Datapro sent repeated requests for information to over 100 companies known or believed to be in the display terminal business. The usable responses summarized in our charts provide a comprehensive picture of the commercial display terminals that are currently available in the United States and Canada. *The absence of any specific company from our charts means that the company either failed to respond to our repeated information requests or was unknown to us.*

The chart entries and their significance are explained in the following paragraphs.

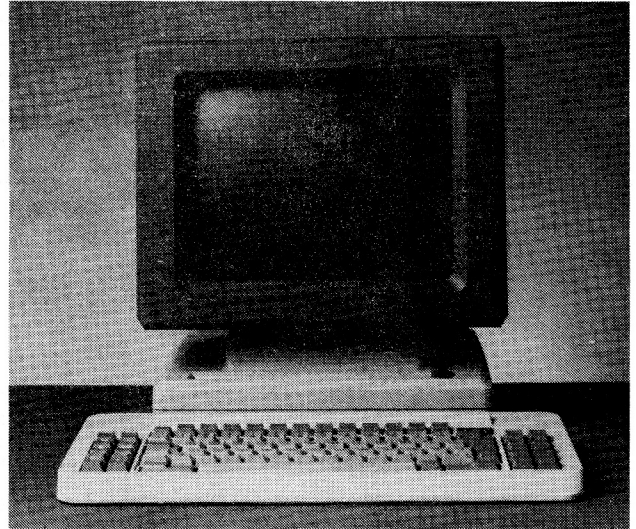
TERMINAL DESCRIPTION

Display terminals are available in one of two basic terminal configurations: *stand-alone* and *cluster*. Stand-alone units are typically those that contain all components that support the operation of the terminal including display, keyboard, interface, and power supply within a single cabinet. Auxiliary units such as printers, cassette tape drives, etc., are usually external devices. Sometimes a stand-alone unit includes separate cabinets for terminal control and keyboard/display sections, and it may even include one or two separate displays. A cluster configuration typically includes a terminal control unit and a number of individual cable-connected keyboard/display units, which can be located several thousand feet from the controller. In some cases, the vendor provides a multiplexer that accommodates a cluster of stand-alone terminals. The size of a cluster arrangement is defined by the *maximum number of displays per controller*.

Terminals that are designed to be hand-held or to be hand-carried, are noted in the entry *transportability*.

Some terminals are designed as direct replacements for other terminals. In the alphanumeric display terminal market, replacement terminals fall into two principal categories: those designed to replace an IBM family terminal are indicated as having *IBM compatibility*; and those designed to replace a terminal in the ASCII/Teletype market are indicated as having *Teletype compatibility*.

Some vendors provide *other compatibility*, and can replace terminals such as those produced by Burroughs, Digital Equipment, Honeywell, and Sperry. For example, a wide variety of vendors market terminals which are compatible with the DEC VT100 (or VT52, the VT100's predecessor).



ITT Courier's 1700 Display Terminal is functionally compatible with the IBM 3178. The 1700 features a 12-inch tilt/swivel screen, and a detached low-profile keyboard. The terminal's footprint measures 13 inches by 12 inches, and the keyboard is 16 inches wide.

Either of two types of compatibility may be offered: transmission compatibility or "plug-to-plug" compatibility. Transmission compatibility requirements include identical protocol, code and unit code structure, timing, asynchronous or synchronous operation, and transmission speed. Some vendors even provide identical cables, which is a cost-effective consideration in a local cluster environment. Most vendors with transmission-compatible units offer additional features and functions that the original vendor's equipment does not have, implemented via minor changes in host software. Units with true plug-to-plug compatibility not only have identical transmission parameters, but also identical features and functions; no alteration to host software is necessary, but no enhancements beyond the original vendor's equipment are available.

DISPLAY PARAMETERS

Information displayed on the screen of a CRT is generally arranged according to an orderly format consisting of a maximum number of printed lines per screen and characters per line. The electronic circuitry that produces the display image is designed to a specified set of parameters that define the *display capacity* (i.e., the maximum number of display positions) and the *screen arrangement* (i.e., the maximum number of displayable lines and displayable characters per line). The most common display capacity is 1920 characters arranged in 24 lines of 80 characters. Many vendors offer 132-character display lines, which can eliminate the need to revise or patch software designed for standard 132-column printers or to maintain dual sets of programs for 80-column and 132-column output.

In most terminals, the number of characters that can be stored by the terminal's display memory equals the maximum screen capacity. In some terminals, however, storage is provided for more characters than can be displayed on the screen at one time. This additional data may be stored

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character-by-character, by the line, or by the "page" (a full screen of data). *Memory capacity* defines the total number of characters, lines, and pages that can be stored in the terminal's display memory.

Information is displayed in a rectangular area, slightly smaller than the total surface of the display screen. The factors that determine the required size of the *screen area* are the display arrangement and the size of the displayable characters. For example, the typical 1920-character display utilizes a 12- or 15-inch (diagonal) screen area.

Ergonomic factors are becoming increasingly important as terminal features. One such feature gaining in popularity is a *tilt and/or swivel screen*. This feature provides for the mounting of the display monitor onto a separate desktop base or pedestal, and allows the operator to twist the screen vertically ("tilt") and/or horizontally ("swivel") to the most advantageous position for viewing.

The set of *total displayable symbols* and the method of *symbol formation* are functions of the character generator, which accepts coded characters (typically ASCII or EBCDIC) from the computer and keyboard and converts them to a number of dots or strokes so that the form of the symbol or image can be displayed. In CRTs, characters are formed almost exclusively by the dot matrix technique. Each character is formed within a matrix of dots, and only those dots required to form the specific character are intensified. For example, a dot matrix that contains 35 dots is typically arranged 7 dots high by 5 dots wide.

Characters can be made clearer by increasing the number of dots within the matrix. The stroke technique forms characters by drawing short straight lines between specified points. *Character phosphor* refers to the physical coating of phosphorous on the back side of the screen which, when illuminated, creates the displayed characters. The type of phosphor used defines the color of the displayed character, as well as the persistence of the phosphor (a long-persistence phosphor is less likely to cause image flicker problems than a short-persistence phosphor; however, the image of a long-persistence phosphor is more likely to smear when lines are scrolled). Among the more common phosphors available are P4 (white), and P31 or P39 (green). Amber and yellow-green phosphors are also available on some terminals.

Display arrangement, display medium, character phosphor, and symbol formation all have a great impact on display clarity. Test several units to decide which is easiest on the operator's eyes.

Attention can be drawn to vital information and different types of significant data can be visually separated by the use of the following display features:

- **Color**—characters or fields can be separated by color, which can also be used to identify conditions or types of data. IBM's color display, the 3279, is currently emulated by many of the independent 3270-compatible vendors.

- **Underline**—highlights significant information by underlining.
- **Blink**—highlights significant information by causing it to blink off and on.
- **Blank (security)**—sensitive information is transmitted, but not shown on the screen.
- **Bold**—highlights significant information by displaying it at a different brightness level.
- **Reverse**—highlights significant information by displaying a negative image of it, e.g., when normal data is displayed in white on a dark background, the highlighted character or field is displayed in dark on a white background.
- **Double size**—highlights significant information by displaying it in characters which are of larger size than normal. Double height, double width, and/or double height/width characters may be supported.

Some terminals offer several of these display features, which can be combined to produce even more effective results. The features are programmable (usually via the keyboard), and can be used on a character-by-character basis, or in a designated field.

Some applications require viewing more data than can be displayed at one time. The following features satisfy this need:

- **Scroll**—this feature moves all displayed lines of data up or down by one line as a new line is added and an existing one removed. In some cases, the first line is linked with the last so that the data is rolled but not lost. In others, data is lost as it rolls off the screen. This feature permits ➤



Phaze Information Machines, located in Scottsdale, Arizona, markets the P3278 Display Station, a three-piece modular unit that is compatible with the IBM 3278 Model 2 Display Station. The P3278 was the first member of Phaze's family of IBM-compatible workstations.

Alphanumeric Display Terminals

- the user to scan through a volume of data to locate key information.

Many vendors now feature smooth scrolling, in which data is rolled or scrolled smoothly up or down (much the same as the credits at the end of a movie).

- *Paging*—this feature defines and stores two or more discrete frames or pages of data and displays any selected page.

Although scroll and paging features can be software implemented in the host computer, the comparison chart entry applies to only those terminals that implement the feature via hardware or firmware. Many terminals provide the scroll feature, but relatively few provide paging. Some provide both features.

The cursor marks the position on the screen where the next character will be read or written from memory. Cursor controls enable the operator to maneuver the cursor on the screen and facilitate the input and output of data. Different manufacturers use a variety of symbols to indicate the cursor position on the screen, for example, an underline, a reverse video block, or a blinking character. Some terminals allow the operator to choose among several types of cursor symbols; the most typical feature being *selectable blinking cursor*. Some terminals also have *addressable/readable cursors*, which enable the position of the cursor to be written or read by the host computer under program control.

Most businesses use printed forms for daily activities such as billing, ordering, payroll, etc. Some CRT terminals can duplicate the printed form on the face of the screen, and data can be keyed into the blank spaces just as the typist enters data into a printed form. This "fill-in-the-blanks" approach to data entry requires a *protected format* capability. Display terminals that incorporate this feature treat the fixed format differently from keyed data. Field identifiers such as "name" or "salesman number" are protected from inadvertent key entry, and data entry is confined to the variable fields (blank spaces) following the field identifiers.

Having completed entry into the fixed format, the operator transmits the data to the central computer. A feature called *partial screen transmit* promotes line economies by transmitting only the keyed data; the fixed format remains displayed and the "blanks" are erased for the next entry. This feature is also useful for transmitting only a portion of the displayed data such as a field, line, or block.

A few vendors now offer a *split screen* and/or "windows" feature on their terminals, in which the display screen can be divided or partitioned into a number of separate workspaces. Data in these workspaces can be manipulated (e.g., scrolled, stored, or transmitted) independently of the rest of the screen. *Tabulation* capabilities allow some terminals to automatically move the cursor to the beginning of the next line, or to the beginning of the next variable field within a line of formatted data immediately following the entry of

the character that completes the end of the current line or field. The tab key needs to be used only when the current line/field is to remain partially filled.

Editing features in a display terminal can consist of any combination of the functions listed below, although the best terminal for editing purposes would include all of them. Each function is performed with respect to the current position of the cursor. The desirable editing functions are:

- *Character insert*—the capability to insert a character into an existing line of displayed text; the remaining characters shift to the right or "spread" to accommodate the added character. The spreading capability may terminate at the last character position of the line or at the last displayable position on the screen. Data is lost when it is spread beyond the termination point.
- *Character delete*—the capability to delete a character from an existing line of displayed text; the remaining text closes up when the character is deleted.
- *Line insert*—the capability to insert a line of text into existing text; the text spreads to accommodate the added line.
- *Line delete*—the capability to delete a line of text from existing text; the remaining text closes up when the line is deleted.
- *Erase*—the capability to erase a character, line of text, message, field, or the complete screen. Most terminals include character erase and some form of display erase, which may erase the entire contents of the display, just that portion following the cursor location, or a combination of both functions. Line erase is optional in many terminals.

KEYBOARD PARAMETERS

Keyboard *style* defines the general arrangement of keys; e.g., typewriter- or data entry (keypunch)-style. Data entry keyboards have a numeric keypad embedded in the alphabetic part of the keyboard which is accessed via numeric shift. The *character/code set* refers to the set of symbols that appear on the keytops and, in many cases, to the actual character codes generated for each key depression, such as ASCII, EBCDIC, APL, etc. Some terminals are available with more than one keyboard style to satisfy particular user needs.

Keyboards that can either fit flush against the display or be located some distance away via cable connection are referred to as *detachable* keyboards. This feature provides increased configuration flexibility and operator convenience.

Some terminals are available with *program function keys*. These are special keys whose character codes are interpreted by the user's program. A function key is used to reduce

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▷ the number of required input keystrokes to save time and reduce the number of input errors. Depressing one key could instruct the system to "sell one seat" or "call Chart A," for example.

A *numeric keypad* is a special keyboard feature that includes a set or block of 10 numeric keys, usually located to the right of the main keygroup. These numeric keys are arranged in an adding-machine format and are particularly useful for applications that require a high volume of numeric entries or arithmetic calculations.

ANCILLARY DEVICES

External I/O devices can add considerable flexibility to the applications possibilities for display terminals. Many vendors provide *serial printers* or *line printers* for use with their terminal families.

Composite video output allows the terminal to drive an auxiliary monitor. This capability is useful in applications such as computer-aided instruction, where there is a need to display the screen image to a group of people.

Other devices supplied and supported by the terminal vendor, such as diskette drives, cassette tape drives, light pens, magnetic stripe (ID card) readers, bar code readers, etc., are also listed. Even if they supply no auxiliary devices themselves, most vendors supply a *port* through which another vendor's printer or other device may be attached to the display.

TRANSMISSION PARAMETERS

Nearly every display terminal contains a communications interface that enables communications between the terminal and the central computer site. *Mode* and *technique* define the operating mode and the method in which data is transmitted. There are two operating modes: half duplex (transmission both directions, but not simultaneously), and full duplex (simultaneous transmission in both directions).

Data is transmitted synchronously or asynchronously. Asynchronous transmission is characterized by the transmission of data in irregular spurts, where the duration of time can vary between successive transmitted characters; the transmission from an unbuffered teletypewriter is a good example. Synchronous transmission implies the transmission of data in a steady stream. The time interval between successive characters is always precisely the same. The communications interface either provides clocking or accepts external clocking signals from the data set.

Communications protocol refers to the type of line discipline (control code sequence and control characters) that the terminal employs. The three most commonly used protocols are ASCII, IBM's Binary Synchronous Communications (BSC) technique, and IBM's Synchronous Data Line Control (SDLC) line discipline. Other large main-frame vendors such as Burroughs, Honeywell, and Digital



Ampex offers a variety of smart editing terminals, including the D125, shown here. Ampex terminals provide emulation for a variety of popular display terminal models manufactured by ADDS, DEC, Esprit Systems (formerly Hazeltine), Lear Siegler, Soroc, and TeleVideo.

Equipment Corporation (DEC) have produced their own communications protocols.

The *transmission code* refers to the bit pattern of the transmitted characters. Two codes are prominent: EBCDIC and ASCII. The latter has been accepted as an industry and government standard, and is now the most commonly used code by display terminals. EBCDIC is most commonly used with IBM equipment and its replacements.

The CRT terminal is a high-speed device that is usually capable of transmitting and receiving several thousand characters per second; however, it must run at a speed that is compatible with the communications system in which it is used. Most terminals are used on voice-grade facilities, which limit the transmission *speed* to a practical maximum of 4800 bits per second over the dial network and 9600 bits per second over leased or private lines.

Message format refers to the way data is transmitted (e.g., by block, by line, or by character). Terminals that are designed to be transmission-compatible with a Teletype unit transmit a character for each key depression. Buffered terminals transmit data in multi-character blocks. The line or block mode permits data to be composed and edited prior to each transmission and generally permits more efficient utilization of the communications facility. Some terminals offer manual selection between the modes.

Multipoint operation characterizes terminals that are capable of operating in a multiple-terminals-per-line environment such as that employed by the IBM 3270 display terminals. Basic to implementing this capability is the ability of a terminal to distinguish a control message in- ▷

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- ▷ tended for it alone. Polling invites the terminals to send data. Addressing informs the terminal that a message from the central computer is coming, so that it will be conditioned to receive. Central control of the message traffic is maintained by the central computer.

Display terminals usually have a *terminal interface* that meets the standards of the EIA RS-232-C specification or the 20mA current loop, and connects to an external modem or acoustic telephone coupler.

Some terminals contain an *integral modem* that can be connected directly to a communications line. In some cases, the vendor provides an *integral acoustic telephone coupler*, so that the terminal can be connected to a conventional telephone handset.

PRICING AND AVAILABILITY

Terminal pricing is provided for unit quantities (one terminal) unless otherwise specified. Two-year lease prices, including maintenance, and purchase prices are shown for the complete terminal (including keyboard, display, and controller) for stand-alone units, and for the keyboard/display station and terminal controller for cluster units. The monthly prime-shift maintenance charge is the cost of service during regular business hours (usually 9 A.M.-5 P.M., Monday-Friday).

Single entries generally indicate the price of the basic unit without options; price ranges show the price of the basic unit and the price of an expanded unit with all options, or the price of the low-end and high-end of a multiple-unit family. In general, all prices exclude ancillary devices. In some cases, the terminal vendor offers a lease term other than those shown, such as a four- or five-year lease or a 30- or 60-day, short-term rental. In such cases, the lease prices and terms appear in the Comments at the bottom of the charts.

Many terminal vendors do not lease their equipment, and in these cases you'll find dashes in the lease price entries. Also, a number of terminal makers sell their wares on an OEM basis only, for incorporation into systems supplied by other vendors. Quantity discounts, and discounts for educational and other institutions, are often available.

Date of announcement indicates the date that the terminal was unveiled to the public.

Date of first production delivery indicates when the first production model of each terminal was delivered (or is scheduled to be delivered) to a customer.

Display units installed to date shows how many display units of each type had been delivered to customers as of approximately October 1, 1983. All figures were supplied by the vendors themselves, and a number of companies chose not to release this information.

Serviced by specifies the party responsible for maintaining the terminal. In some cases, the vendor provides total

service; in others, a national service organization is responsible. Service is sometimes rendered under the combined efforts of both the vendor and an independent service organization; usually in this situation, the vendor handles those areas close to its headquarters or where it has a multiplicity of installations, and the service company handles other geographical areas.

COMMENTS

Comments at the bottom of the charts describe significant or unusual features, capabilities, or applications which are not reflected in the standard entries.

VENDORS

Listed below, for your convenience in obtaining additional information, are the full names and addresses of the 92 vendors whose products are summarized in the comparison charts.

Altos Computer Systems, 2641 Orchard Parkway, San Jose, CA 95134. Telephone (408) 946-6700.

Ampex Corporation, 200 N. Nash Street, El Segundo, CA 90245. Telephone (213) 640-0150.

Anderson Jacobson, Incorporated, 521 Charcot Avenue, San Jose, CA 95131. Telephone (408) 263-8520.

Ann Arbor Terminals, Incorporated, 6175 Jackson Road, Ann Arbor, MI 48103. Telephone (313) 663-8000.

Applied Digital Data Systems, Incorporated (ADDS), 100 Marcus Boulevard, Hauppauge, NY 11787. Telephone (516) 231-5400.

Beehive International, 4910 Amelia Earhart Drive, Salt Lake City, UT 84125. Telephone (801) 355-6000.

The Braegen Corporation, 525 Los Coches Street, Milpitas, CA 95035. Telephone (408) 945-8150.

Burroughs Corporation, Burroughs Place, Detroit, MI 48232. Telephone (313) 972-7000.

Carterfone Communications Corporation, 1111 W. Mockingbird Lane, Suite 1400, Dallas, TX 75247. Telephone (214) 630-9700.

CIE Terminals, Inc., (subsidiary of C. Itoh Electronics), 2505 McCabe Way, Irvine, CA 92714-6297. Telephone (714) 660-1421.

Cobar, Inc., 2570 E. Cerritos Avenue, Anaheim, CA 92806. Telephone (714) 937-1954.

Computer Communications, Inc., (CCI), 2610 Columbia Street, Torrance, CA 90503. Telephone (213) 320-9101.

Control Concepts Corporation, P.O. Box 2367, 12004B Ballsford Rd., Manassas, VA 22110. Telephone (703) 631-0435.

Control Data Corporation, 8100 34th Avenue South, P.O. Box 0, Minneapolis, MN 55440. Telephone (612) 853-8100.

CTI Data Corporation, 5249 North Boulevard, Raleigh, NC 27604. Telephone (919) 876-8731.

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➤ **Data General Corporation**, 4400 Computer Drive, Westboro, MA 01580. Telephone (617) 366-8911.

Datamaxx USA Corporation, 1815 South Gadsden Street, Tallahassee, FL 32301. Telephone (904) 224-8213.

Datamedia Corporation, 7401 Central Highway, Pennsauken, NJ 08109. Telephone (609) 665-5400.

Datapoint Corporation, 9725 Datapoint Drive, San Antonio, TX 78284. Telephone (512) 699-7000.

Datavue Corporation, 225 Technology Park, Norcross, GA 30130. Telephone (404) 449-5961.

Decision Data Computer Corporation, 100 Witmer Road, Horscham, PA 19044. Telephone (215) 674-3300.

Delta Data Systems Corporation, 2595 Metropolitan Drive, Trevoze, PA 19047. Telephone (215) 322-5400.

Dentronix Systems, Incorporated, 2635 Croddy Way, Santa Ana, CA 92704. Telephone (714) 966-0015.

Digital Equipment Corporation (DEC), 146 Main Street, Maynard, MA 01754. Telephone (617) 897-5111.

Direct, Inc., 4201 Burton Drive, Santa Clara, CA 95054. Telephone (408) 980-1414.

Epic Computer Products, Inc., 18381 Bandilier Court, Fountain Valley, CA 92708. Telephone (714) 964-4722.

Esprit Systems, Inc., Hazeltine Terminals Division, 100 Marcus Drive, Melville, NY 11747. Telephone (516) 293-5600.

Falco Data Products, Inc., 1286 Lawrence Station Road, Sunnyvale, CA 94086. Telephone (408) 745-7123.

General Digital Corporation, 700 Burnside Avenue, East Hartford, CT 06108. Telephone (203) 528-9041.

General Terminal Corporation, 14831 Franklin Avenue, Tus-
tin, CA 92680. Telephone (714) 730-0123.

Harris Corporation, Information Terminals Group, 16001 Dallas Parkway, P.O. Box 400010, Dallas, TX 75240. Telephone (214) 386-2000.

Hazeltine Corporation, see Esprit Systems.

Hewlett-Packard, Data Terminals Division, 3645 Cincinnati Avenue, Rocklin, CA 95677. Telephone (916) 786-8000.

Honeywell, Incorporated, U.S. Marketing & Service Division, 200 Smith Street, Waltham, MA 02154. Telephone (617) 890-8400.

Human Designed Systems, Incorporated, 3440 Market Street, Philadelphia, PA 19104. Telephone (215) 382-5000.

Icot Corporation, 830 Maude Avenue, Mountain View, CA 94543. Telephone (415) 964-4635.

Informer Computer Terminals, Inc., 22936 Mill Creek Road, Laguna Hills, CA 92653. Telephone (714) 855-3112.

Intecolor, an Intelligent Systems Company, 225 Technology Park, Norcross, GA 30092. Telephone (404) 449-5961.

Interaction Systems, Inc., 24 Munroe Street, Newtonville, MA 02160. Telephone (617) 964-5300.

International Business Machines Corporation (IBM), Information Systems Group, National Accounts Division, 1133 Westchester Avenue, White Plains, NY 10604. Telephone (914) 696-1900.

International Business Machines Corporation (IBM), Information Systems Group, National Marketing Division, 4111 Northside Parkway, Atlanta, GA 30327. Telephone (404) 238-2000.

Intertec Data Systems Corporation, 2300 Broad River Road, Columbia, SC 29210. Telephone (803) 798-9100.

C. Itoh Electronics (ACM: Exclusive Marketer), 3857 Birch Street, Suite 540, Newport Beach, CA 92660. Telephone (800) 854-5959.

ITT Courier Terminal Systems, Incorporated, 1515 West 14th Street, Tempe, AZ 84281. Mailing Address: P.O. Box 29039, Phoenix, AZ 85038. Telephone (602) 275-7555.

IXO, Inc., 5757 Uplander Way, Culver City, CA 90230. Telephone (213) 417-8080.

Kimtron Corporation, 2255-I Martin Avenue, Santa Clara, CA 95050. Telephone (408) 727-1510.

Lear Siegler, Incorporated, Data Products Division, 714 North Brookhurst Street, Anaheim, CA 92803. Telephone (714) 774-1010.

Lee Data Corporation, 7075 Flying Cloud Drive, Eden Prairie, MN 55344. Telephone (612) 828-0300.

Liberty Electronics USA, 100 Clement Street, San Francisco, CA 94118. Telephone (415) 751-7560.

MDS Trivex, Incorporated (Division of Mohawk Data Sciences), 3180 Red Hill Avenue, Costa Mesa, CA 92626. Telephone (714) 546-7781.

Megadata Corporation, 35 Orville Drive, Bohemia, NY 11716. Telephone (516) 589-6800.

Memorex Corporation, Communications Group, 18922 Forge Drive, Cupertino, CA 95014. Telephone (408) 996-9000.

Microdata Corporation, 17481 Red Hill Avenue, Irvine, CA 92713. Telephone (714) 540-6730.

Micro-Term, Incorporated, 512 Rudder Road, Fenton, MO 63026. Telephone (314) 343-6515.

Nabu Commercial Terminals Limited, (formerly Volker-Craig), 330 Weber Street North, Waterloo, Ontario, Canada N2J 3H6. Telephone (519) 884-9300.

NCR Corporation, 1700 South Patterson Boulevard, Dayton, OH 45479. Telephone (513) 445-5000.

Northern Technologies, Limited, 85 Torbay Road, Markham, Ontario, Canada L3R 1H1. Telephone (416) 475-9123.

Northern Telecom, Inc., 9705 Data Park, P.O. Box 1222, Minneapolis, MN 55440. Telephone (612) 932-8000.

Paradyne Corporation, 8550 Ulmerton Road, Largo, FL 33540. Telephone (813) 530-2000.

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- **Peripheral Technology, Inc.**, 14784 N.E. 95th, Redmond, WA 98052. Telephone (206) 881-6691.
- Perkin-Elmer**, Terminals Division, 360 Route 206 South, Flanders, NJ 07836. Telephone (201) 584-1400.
- Perry Data Systems, Inc.**, 3401 Spring Forest Road, Raleigh, NC 27658. Telephone (919) 876-8100.
- Phaze Information Machines Corporation**, 7650 E. Redfield Road, Scottsdale, AZ 85260. Telephone (602) 991-6855.
- Plantronics, Inc.**, 345 Encinal Street, Santa Cruz, CA 95060. Telephone (408) 426-5858.
- Prime Computer, Inc.**, Prime Park, Natick, MA 01760. Telephone (617) 655-8000.
- Protocol Computers, Inc.**, 6150 Canoga Avenue, Suite 100, Woodland Hills, CA 91367-3773. Telephone (213) 716-5500.
- Qume Corporation**, 2350 Qume Drive, San Jose, CA 95131. Telephone (408) 942-4000.
- Racal-Milgo, Incorporated**, Computer Products Division, 6250 N.W. 27th Way, Ft. Lauderdale, FL 33309. Telephone (305) 979-4000.
- Radio Shack/Tandy Corporation**, 1800 One Tandy Center, Fort Worth, TX 76102. Telephone (817) 390-3300.
- Raytheon Data Systems**, 1415 Boston-Providence Turnpike, Norwood, MA 02062. Telephone (617) 762-6700.
- RCA MicroComputer Products**, New Holland Avenue, Lancaster, PA 17604. Telephone (717) 397-7661.
- Soroc Technology, Incorporated**, 165 Freedom Avenue, Anaheim, CA 92801. Telephone (714) 992-2860.
- Sperry Corporation**, P.O. Box 500, Blue Bell, PA 19422. Telephone (215) 542-4011.
- Tab Products Co.**, Electronics Office Products Division, 1451 California Avenue, Palo Alto, CA 94304. Telephone (415) 858-2500.
- Tandberg Data, Inc.**, Labriola Court, P.O. Box 99, Armonk, NY 10504. Telephone (914) 273-6400.
- Tandem Computers, Inc.**, 19333 Vallco Parkway, Cupertino, CA 95014. Telephone (408) 725-6000.
- TEC, Incorporated**, 2727 North Fairview Avenue, Tucson, AZ 85703. Telephone (602) 792-2230.
- Tektronix, Incorporated**, Information Display Division, P.O. Box 500, Beaverton, OR 97077. Telephone (503) 644-0161.
- Telcon Industries, Inc.**, 1401 N.W. 69th Street, Ft. Lauderdale, FL 33309. Telephone (305) 971-2250.
- Teleram Communications Corporation**, 2 Corporate Park Drive, White Plains, NY 10604. Telephone (914) 694-9270.
- Teleray, Division of Research Incorporated**, P.O. Box 24064, Minneapolis, MN 55424. Telephone (612) 941-3300.
- Teletype Corporation**, 5555 Touhy Avenue, Skokie, IL 60077. Telephone (312) 982-2000.
- TeleVideo Systems, Incorporated**, 1170 Morse Avenue, Sunnyvale, CA 94086. Telephone (408) 745-7760.
- Telex Computer Products, Inc.**, 6422 E. 41st Street, Tulsa, OK 74135. Telephone (918) 627-1111.
- Termiflex Corporation**, 18 Airport Road, Nashua, NH 03063. Telephone (603) 889-3883.
- Term-Tronics Incorporated**, 7408 Trade Street, San Diego, CA 92121. Telephone (916) 271-1770.
- Texas Instruments, Inc.**, Data Systems Group, P.O. Box 2909, Austin, TX 78769. Telephone (512) 250-7111.
- Tymshare, Inc.**, Equipment Product Marketing, 20705 Valley Green Drive, Cupertino, CA 95014. Telephone (408) 446-6000.
- Visual Technology, Incorporated**, 540 Main Street, Tewksbury, MA 01876. Telephone (617) 851-5000.
- Western Union Data Services Company**, 1 Lake Street, Upper Saddle River, NJ 07458. Telephone (201) 825-5000.
- Westinghouse Canada Inc.**, P.O. Box 5009, 777 Walker's Line, Burlington, Ontario, Canada L7R 4B3. Telephone (416) 528-8811.
- Wyse Technology, Inc.**, 3040 North First Street, San Jose, CA 95143. Telephone (408) 946-3075.
- Xerox Computer Services**, 5310 Beethoven Street, Los Angeles, CA 90066. Telephone (213) 306-4000.
- Zenith Data Systems**, 1000 Milwaukee Avenue, Glenview, IL 60025. Telephone (312) 391-8860.
- Zentec Corporation**, 2400 Walsh Avenue, Santa Clara, CA 95050. Telephone (408) 246-7662. □

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SUPPLIER AND MODEL	Altos 2	Ampex D125	Ampex D150	Ampex D175	Anderson Jacobson AJ 510
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. Altos, ANSI X3.41 ANSI X3.64	Stand-alone — No No Std. See comments	Stand-alone — No No Std. See comments	Stand-alone — No No Std. See comments	Stand-alone 1 No 2741 (opt.) Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	2000, 5280 — 25 x 80, 40 x 132	1920 80/24/1 24 x 80	1920 80/24/2 or 4 24 x 80	1920 80/24/2 or 4 24 x 80	1920 — 24 x 80
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	14 Std. 512 7 x 12, 5 x 7 dot P31 green	12 No 128 ASCII & graphics 7 x 12 dot matrix P4 white, P31 green, PC 134 amber std. No	12 No 207 ASCII & graphics 7 x 10 dot matrix P4 white, P31 green, PC 134 amber std. No	12 No 207 ASCII & graphics 7 x 10 dot matrix P4 white, P31 green, PC 134 amber std. No	15 No 128 ASCII 7 x 10 dot matrix P31 green std. No
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size	No Std. Std. Std. Std. Std. Std.	Std. Std. Std. No Std. Std. No	Std. Std. Std. No Std. Std. Std.	Std. Std. Std. No Std. Std. Std.	Std. Std. No Std. Std. Std. Up/down std.
Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	Up, down, smooth 3 std. (25 x 80) Std. Std. Std. Std. Std. Std. Fwd./back. std. Std. Std. Std.	Up 1 std. Std. Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	Up/smooth/jump 2 std., 2 opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	Up/smooth/jump 2 std., 2 opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	Up/down std. No Std. Std. Std. Std. No Fwd. std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style	Typewriter	Typewriter	Typewriter	Typewriter-selectric	Typewriter
Character/code set Detachability Program function keys	128 ASCII Std. 16 plus shifted std. Std.	128 ASCII Std. 12 Std.	128 ASCII Std. 20 Std.	128 ASCII Std. 20 Std.	128 ASCII; APL opt. No No Std.
Numeric keypad	Std.	Std.	Std.	Std.	Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No RS-232-C —	No No No Std. —	No No No Std. —	No No No Std. —	Various, 30-200 cps No No Std. Diskette recorder, acoustic coupler/ modems
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half/full-duplex Asynchronous — ASCII 50-19,200 Character No RS-232-C	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C	Half/full-duplex Asynchronous ASCII ASCII 110-9600 Char./line/page No RS-232-C std.; 20mA opt. No No
Integral modem Integral acoustic coupler	No No	No No	No No	No No	No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 995 — — 11/82 3/83 2,500 Altos/TRW	— — 679 — — 3/83 7/83 — TRW	— — 849 — — 11/82 3/83 — TRW	— — 869 — — 11/82 3/83 — TRW	100-150 See comments 25 9/78 Anderson Jacobson
COMMENTS	Available in production quantities	Features selectable emulation of 20 terminal models from ADDS, DEC, Hazeltime, Lear Siegler, Soroc, & TeleVideo	Features selectable emulation of 20 terminal models from ADDS, DEC, Hazeltime, Lear Siegler, Soroc, & TeleVideo	Features selectable emulation of 20 terminal models from ADDS, DEC, Hazeltime, Lear Siegler, Soroc, & TeleVideo	APL keyboard opt.; widely used in X-L applications; ter- minals priced below \$2,000—contact vendor for detailed pricing

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Anderson Jacobson AJ 520	Ann Arbor Ambassador	Ann Arbor Genie	Ann Arbor Genie +	Ann Arbor Guru
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by COMMENTS	Stand-alone 1 No No Std. DEC VT100/VT52 1920, 3168 16K 24 x 80, 24 x 132 plus status line 15 Tilt std. 128 ASCII 10 x 12 dot matrix P31 green std.; amber opt. No Std. Std. No Std. Std. Std. Std. Up/down std. 8 std. Std. Std. No No 2 Fwd. std. Std. Std. Char./line/screen std. Typewriter 128 ASCII; APL opt. Std. 24 std. Std. Various, 30-200 cps No Std. Std. Diskette recorder, acoustic coupler/ modems Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C std.; 20mA opt. No No 100-150 — See comments — 25-28 — 9/81 — Anderson Jacobson APL unit includes line mode, user- defined overstrike memory, plus all video attributes except bold; con- tact vendor for detailed pricing	Stand-alone — No No Std. DEC VT100/VT52, ANSI X.64 opt. 4800 4800/60/1 18 x 80 up to 60 x 80 15 Opt. stand 128 ASCII 7 x 9 dot matrix P39 green std.; P4 white opt. No Std. Std. Std. Std. No Up/down slow std. Std. Std. Both std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std. Typewriter 128 ASCII Std. 38 std. Std. No No Std. No Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Char./line/block No RS-232-C std.; 20mA/ RS-422 opt. No No — 1,595 — — 5/80 6/80 15,000 Ann Arbor/unit exchange Implements the ANSI X3.64-1979 standard, user-definable operation; user- selectable display format	Stand-alone — No No Std. DEC VT100, ANSI 3.64 std. 2400 2400 std./30/1 30 x 80 15 Opt. stand 128 ASCII 7 x 9 dot matrix P4 white std. No Std. Std. Std. No Up/down; slow opt. No; 2 pp opt. Std. Both std. No No 3 std. Fwd./back tab std. Std. Std. Char./line/screen std. Typewriter 128 ASCII Std. 26 std. Std. No No Opt. No Half/full-duplex Asynchronous ASCII, ANSI X3.64 ASCII 110-19,200 Character No RS-232-C std.; 20mA/ RS-422 opt. No No — 1,195 — — 11/82 12/82 — Ann Arbor/unit exchange ANSI X3.64 com- patible; user- selectable display format	Stand-alone — No No Std. DEC VT100/VT52, ANSI X3.64 opt. 2400 4800, 30/80/2 30 x 80 15 Opt. stand 128 ASCII 7 x 9 dot matrix P4 white std.; P42 green opt. No Std. Std. Std. No Up/down std.; slow 2 std. Std. Both std. Std. Std. Fwd./back tab std. Std. Std. Char./line/screen std. Typewriter 128 ASCII Std. 38 std. Std. No No No Std. — Half/full-duplex Asynchronous ASCII, ANSI X3.64 ASCII 110-19,200 Char./line/block No RS-232-C std.; 20mA/ RS-422 opt. No No — 1,395 — — 11/82 12/82 2,000 Ann Arbor/unit exchange ANSI X3.64 com- patible	Stand-alone — No No Yes DEC VT100, ANSI X3.64 11,200 To 25K To 66 x 170 15 Opt. stand 128 ASCII 7 x 9 dot matrix P42 green std. No Std. Std. Std. Std. Opt. Up/down, smooth std. 2 std. Std. Both std. Std. Std. N. prog std. Fwd./back tab std. Std. Std. Char., screen std. Typewriter 128 ASCII Std. 38 No No No Std. No Half/full-duplex Asynchronous ANSI X3.64 ASCII 110-14.2K No RS-232-C std.; 20mA/ RS-422/23 opt. No No — 2,395 — — 5/83 6/83 — Ann Arbor

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Ann Arbor Model 400S	ADDS Viewpoint	ADDS Viewpoint/ Color	ADDS Viewpoint/G	ADDS Viewpoint/3A Plus
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. —	Stand-alone 1 No No Std. —	Stand-alone — No No Std. —	Stand-alone — No No Std. ADDS Viewpt., Tek. 4010/4012/Plot 10	Stand-alone 1 No No Std. Lear Siegler ADM 3
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1920/24/1 12 x 40, 24 x 40, 24 x 80 15 Opt. stand 95 ASCII 7 x 9 dot matrix P4 white std.; P39 green opt. No No Std. No Std. Std. Opt. Up/down std. No No Add. std.; read opt. No No No No No No No Screen std.	1920 1 page 24 x 80 12 Tilt std. 128 5 x 7 dot matrix P4 white, P31 green No Std. Std. Std. No Std. Up std. No Std. Addressable only No No No No No No Line/page std.	1920 1 page 24 x 80 plus status line 13 Std. 128 ASCII & 11 grap. 5 x 7 dot matrix P22 color 8 colors std. No Std. Std. Std. No Up std. 1 std. Both std. Std. Std. Fwd./back std. Std. Std. Line/screen std.	1920 1 page 24 x 80 12 Tilt std. 128 ASCII + graphics 7 x 8 dot matrix P4 white, P31 green No Std. Std. Std. No Up std. No Std. Addressable only No No No No No No Line/screen std.	1920 1 page 24 x 80 12 Tilt std. 128 5 x 7 dot matrix P4 white, P31 green No Std. Std. Std. No Std. Std. Addressable only No No No No No No Line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	TTY 128 ASCII Std. Up to 36 opt. Std.	Typewriter 128 ASCII Std. 3 std. Std.	Typewriter ASCII Std. 8 std. Std.	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter 128 ASCII Std. No Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Std. No No	No No Opt. Std. —	No No No — —	No No No Std. —	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII 110-9600 Character No RS-232-C std.; 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII Up to 19,200 Character No RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Char./line/block No RS-232-C; RS-422, CL opt. No No	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Character No RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII Up to 19,200 Character No RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,220 795 — 6/77 7/77 — Ann Arbor	— — 650 — — 3/81 4/81 — ADDS, NCR, TRW, GE	— — 995 — — 11/82 5/83 — ADDS, NCR, TRW, GE	— — 1,750 — — 5/83 — — ADDS, NCR, TRW, GE	— — 650 — — 12/81 1st Q/82 — ADDS, NCR, TRW, GE
COMMENTS				Five operating modes: Basic; Graphics Vector; Graphics Point; Graphics Alpha; Graphics Cursor; 512 x 256 pixel bit-mapped display	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	ADDS Viewpoint/60	ADDS Viewpoint/60G	ADDS Viewpoint/78	ADDS Viewpoint/78 Color	ADDS Viewpoint/90
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. ADDS Regent 40, 60	Stand-alone — No No Std. ADDS View/60,Tek. 4010/4012/Plot 10	Stand-alone — No 3278 Std. —	Either — No 3279 Std. —	Stand-alone 1 No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80 plus status line 12 Tilt std. 128 ASCII 7 x 8 dot matrix P4 white, P31 green No Std. Std. Std. No Std. No Std. No Std. No Std. Both std. No No No Std. Std. Std. Std.	1920 1 page 24 x 80 plus status line 12 Tilt std. 128 ASCII + graphics 7 x 8 dot matrix P4 white, P31 green No Std. Std. Std. No Std. Both std. No No No Std. Std. Std. Std.	1920 1 page 24 x 80 plus status line 12 Tilt std. 128 ASCII & 11 grap. 7 x 8 dot matrix P4 white, P31 green No Std. Std. Std. No Up std. Std. Both std. No No No No No No Line/screen std.	1920 1 page 24 x 80 13 Tilt std. 128 ASCII 7 x 9 dot matrix P22 color 4 colors std. Std. Std. Std. Std. No Up std. Std. Both std. No No No No No No Line/screen std.	1920, 3840 1-2 pages 12-24 x 40-80 12 Tilt std. 128; 256 prog 7 x 9 dot matrix P4 white, P31 green No Std. Std. Std. No Std. Std. Std. Std. 2 pages opt. Std. Both std. Std. Std. Std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter 128 ASCII Std. 8 std. Std.	IBM 3278-2 ASCII Std. 24 std. Std.	IBM 3278-2 ASCII Std. 24 std. Std.	Typewriter 128 ASCII Std. Std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	No No No Std. —	No No No — —	No No No — —	N No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Char./block No RS-232-C, 20mA, RS-422 No No	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Char./block No RS-232-C; RS-422, CL opt. No No	Full-duplex Asynchronous — ASCII 110-19,200 Character No RS-232-C; RS-422, CL opt. No No	Full-duplex Asynchronous — ASCII 110-19,200 Character No RS-232-C; RS-422, CL opt. No No	Half/full-duplex Asynchronous ASCII ASCII Up to 9600 Char./line/block No RS-232-C; 20mA opt. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 895 — — 4/82 — — ADDS, NCR, TRW, GE	— — 1,950 — — 5/83 — — ADDS, NCR, TRW, GE	— — 1,095 — — 11/82 1/83 — — ADDS, NCR, TRW, GE	— — 1,995 — — 5/83 — — ADDS, NCR, TRW, GE	— — — — — 12/81 1st Q/82 — — ADDS, NCR, TRW, GE
COMMENTS		Five operating modes: Basic; Graphics Vector; Graphics Point; Graphics Alpha; Graphics Cursor; 512 x 256 pixel bit-mapped display	Emulates IBM 3278 Model 2 when used with protocol converter	Color terminal designed to access 3270 applications on an IBM mainframe when used with a protocol converter	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Beehive DM310	Beehive DM3270	Beehive DM78	Beehive DM83	Beehive ATL-008
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No 3101-22/23 Std. —	Stand-alone 1 No 3276/3275 BSC No —	Cluster 32 No 3278 Std. Beehive DM5A	Stand-alone 1 No No No Burroughs TD830/ MT983	Stand-alone 1 No No Std. ANSI X3.64 DEC VT 100
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1 page 24 x 80 12 No 128 ASCII 7 x 10 cell P42 green No No Std. Std. Std. No No Up std. No Std. Both std. Std. Std. No Std. Std. Std. Std. EOP/EOL/EOF/ screen std.	1920 — 24 x 80 plus status line 12; 15 opt. No 128 7 x 7 dot matrix P42 green No Std. Std. Std. Std. No No No Std. Both std. Std. Std. Fwd./back std. Std. No Char./screen/field std.	1920 1 page 24 x 80 12; 15 opt. No 128 ASCII 7 x 10 cell P42 green No Std. Std. Std. Std. No Up std. 1 std., 2 opt. Std. Both std. No Std. Std. Std. Std. Std. Screen/char./EOF/ EOL std.	1920 16K std., 36K opt. 24 x 80 12 No 256 ASCII 8 x 10 cell P42 green No Std. Std. Std. Std. No Up std. 4 std., 9 opt. Std. Both std. Std. Std. Std. Std. Std. Std. EOP/EOL/screen std.	2160, 3564 32K std., 128K opt. 27 x 80/132 14 Std. 256 ASCII 9 x 13 dot matrix P31 green No Std. Std. Std. Std. Std. Up/down std. 12 pages std. Std. Both std. Std. Std. 12 std. Forward/back std. Std. Std. Page/line/field/ BOP/EOP
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter 128 EBCDIC Std. 24 + 3 PA keys Std.	Typewriter 256 ASCII/EBCDIC Std. 24 std. Std.	Typewriter 256 ASCII Std. 16 std. Std.	Typewriter 256 ASCII Std. 16 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	No No No Std. Alarm, bidir. RS-232-C aux. port	No No No Std. —	No No No Std. —	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous TTY ASCII 110-9600 Char./line/blk No RS-232-C, 20mA, RS-422 No No	Half duplex Synchronous BSC EBCDIC 150-9600 Block Std. RS-232-C No No	Half/full-duplex Asynchronous TTY ASCII 110-19,200 Char./line/block No RS-232-C, RS-422, 20mA No No	Half/full-duplex Async./sync. Burroughs ASCII 50-19,200 Block/line/page Std. RS-232-C, TDI No No	Half/full-duplex Asynchronous ANSI X3.64 ASCII 50-56K Char./line/field/blk No RS-232-C, 20mA, RS-422 No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Third party — 1,295 — — 11/81 12/81 — Beehive & Western Union	Third party — 2,395 — — 2/81 — Beehive & Western Union	Third party — 1,495 4,000-up — 1/82 4/82 — Beehive & Western Union	Third party — 1,995 — — 4/82 5/82 — Beehive & Western Union	— — 1,495 — — 11/82 12/83 — Beehive & Western Union
COMMENTS		Supports serial ASCII printer	Designed to emulate IBM 3278 when used with protocol converter		Vertical scrolling ability for 132-character display mode

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Beehive Topper	Braegen 8521	Braegen 8522	Braegen 8523	Braegen 3081
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either 8 No 3270 (w/CC76 cont.) Std. CP/M, BSTAM, BSTMS	Cluster 120 — 3278 BSC, SDLC — —	Cluster 120 — 3278 BSC, SDLC — —	Cluster 120 — 3278 BSC, SDLC — —	Cluster 32 No 3270, 1403, 2501 No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 64K RAM 24 x 80 plus status line 12 No 256 ASCII, EBCDIC 7 x 10 dot matrix P42 green No Std. Std. Std. Std. Std. No Up/down std. Cont. by CP/M soft. Std. Std. Std. w/CP/M soft. (opt.) w/CP/M soft. (opt.) Std. Std. Std. Std. Char./EOF std.	1920 24 x 80 24 x 80 15 Std. 136 EBCDIC 7 x 10 dot matrix P109 std. — Std. Std. Std. Std. Std. No No Opt. Std. Std. Std. Char./line/screen std.	1920, 3564 24 x 80, 27 x 132 24 x 80, 27 x 132 15 Std. — 7 x 10 dot matrix P109 std. — Std. Std. Std. Std. Std. No No Opt. Std. Std. Std. Char./line/screen std.	— — — — — — 7 x 10, 7x8 dot matrix P109 std. — Std. Std. Std. Std. Std. No No Opt. Std. Std. Std. Char./line/screen std.	2000 1 page 25 x 80 12 No 196 7 x 9 dot matrix P31 green No Std. Std. Std. Std. Std. Opt. No Opt. Opt. Std. Std. Std. Std. No Std. Std. Opt. Char./field/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	IBM 3270 ASCII (or EBCDIC) Std. 24 std. Std.	Typewriter, data entry, APL EBCDIC Std. 24 std. Std.	Typewriter, data entry, APL — Std. 24 std. —	Typewriter, data entry, APL — Std. 24 std. —	Typewriter, data entry, console 256 EBCDIC Std. 12 std.; 24 opt. Opt.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. RS-232-C —	200/50 cps 400, 1200 No No No	200/50 cps 400, 1200 — No No	200/50 cps 400, 1200 — No No	Various Various No No Alarm, card reader
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII 110-9600 Char./field Opt. — RS-232-C No	Full duplex Synchronous BSC, SNA/SDLC EBCDIC 1.5M — Std. RS-232-C No No	Full duplex Synchronous BSC, SNA/SDLC EBCDIC 1.5M — Std. RS-232-C No No	Full duplex Synchronous BSC, SNA/SDLC EBCDIC 1.5M — Std. RS-232-C No No	Half-duplex Synchronous BSC EBCDIC 1200-19,200 Char./block Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 2,995 6,000 (CC76) — 6/82 8/82 — Beehive/Western Union	Contact vendor — — — — 8/83 11/83 — Braegen	Contact vendor — — — — 8/83 11/83 — Braegen	Contact vendor — — — — 8/83 11/83 — Braegen	52 320 2,666 15,200 15(displ.);55 (cont.) — — — Braegen
COMMENTS	Operates in cluster configuration with CC76 Cluster Con- troller—IBM 3705 BSC/SNA-compatible	Replaces channel connected IBM 3274. Allows up to 60 3278 replacement tubes to communicate on one physical COAX cable			May be connected to up to 8 IBM hosts, local & re- mote, and switched to operate with 14 different applica- tions

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Braegen 3161	Burroughs ET 1100	Burroughs TD 830	Burroughs MT 985	Burroughs SR 110
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Cluster 32 No 3270 local/BSC No —	Stand-alone 1 No No No Burroughs	Stand-alone 1 No 3275 opt. No Burroughs	Stand-alone 1 No — No Burroughs	Stand-alone 1 No No No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 1 page 25 x 80 15 No 196 7 x 9 dot matrix P31 green No Std. Std. Std. Std. Opt. No Opt. Opt. Std. Std. Std. Std. Std. No Std. Std. Opt. Char./field/screen std.	2080 10 pages 12/24 x 40/80 plus 2 status 14 Std. 256 7 x 9 dot matrix P39 green — Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Line/page std.	2000 2000 char. (4080) 25 x 80 11 No 128 5 x 7 dot matrix White No Std. Std. Std. Std. Std. Up/down std. Std. Std. Std. Std. Std. Fixed/var./reverse Std. Std. Line/page std.	2000 2000 char. (8000) 26 x 80 12 No 128 7 x 11 dot matrix Green No Std. Std. Std. Std. Std. Up/down std. Std. Std. Std. Std. Std. Std. Std. Std. Line/page std.	2000 2000 char. (10,000) 25 x 80 12 Std. 128 7 x 9 dot matrix P4 white No Std. Std. Std. Std. Std. Std. 5 std. Std. Std. Std. Std. Std. Std. Std. Std. Fwd./back std. Std. Std. Std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, data entry, APL 256 EBCDIC Std. 12 std.; 24 opt. Std.	Typewriter 128 ASCII Std. — Std.; 25-key opt.	Typewriter, data entry 128 ASCII Std. — Opt.	Typewriter, data entry 128 ASCII Std. — Opt.	Typewriter, data entry 128 ASCII Std. 16 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Various Various No No Alarm, card reader	Std. Std. No Std. Audible alarm	Std. Std. No Std. Audible alarm, ID card reader	Std. Std. No Std. Magnetic card reader, microdisk subsystem	30 cps, 90 lps 375 lpm Std. Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format: character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half-duplex Synchronous BSC Burroughs EBCDIC 1200-19,200 Char./block Std. RS-232-C No No	Half-duplex Async./sync. Burroughs ASCII Up to 38,400 Char./block Std. RS-232-C, TDI No No	Half-duplex Async./sync. Burr./BSC Burroughs ASCII Up to 38,400 Char./block Std. RS-232-C No No	Half-duplex Async./sync. Burroughs ASCII Up to 38,400 Char./block Std. RS-232-C No No	Half-duplex Async./sync. Burroughs ASCII Up to 9600 Char./block Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	52 320 3,698 15,200 15(displ.); 55(cont.) — 3/80 — Braegen	105 (1-yr.) — 1,895 — 122-244 (annual) 4/83 5/83 — Burroughs	143-179 (1 yr.) — 3,289-3,997 — — 8/76 — Burroughs	164-174 (1-yr.) — 2,395 — — 3/82 4/82 — Burroughs	— — 1,695 — 300/150 (depot) 6/82 8/82 — Burroughs
COMMENTS	May be connected to up to 8 IBM hosts, local & re- mote, and switched to operate with 14 different applica- tions; APL support		Models include TD 831, TD 832, TD 833, & TD 834		

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Carterfone 7276	Carterfone 9830	CIE Terminals CIT 80	CIE Terminals CIT 101	CIE Terminals CIT-101e
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No 3276 BSC No —	Stand-alone 1 No No Std. Burroughs TD 830/ MT 983	Stand-alone 1 No No Std. DEC VT52/VT101	Stand-alone 1 No No Std. DEC VT52/VT100/ VT101/VT102	Stand-alone 1 No No Std. DEC VT52/VT100/ VT101/VT102
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80 plus status line 12 No 94 EBCDIC 7 x 9 dot matrix P4 white No No No No Std. No No Std. No No Std. Both std. Std. Std. No Fwd./back std. Std. No Field/screen std.	480, 960, 1920 4000 std., 4000 opt. 12 x 40/80, 24 x 40/80 12 No 128 ASCII 9 x 12 dot matrix P31 green No Std. Std. Std. Std. No Std. Both std. Std. Std. No Fwd./back std. Std. Std. Line/page std.	1920 80/24/1 25 x 80 12 No 128 ASCII 7 x 9 dot matrix P4 white std.; P31 green/amber opt. No Std. Std. Std. Std. No Up/down/jump/sm. No Std. Both std. No No 3 std. Fwd./back std. No No Line/screen/char./ window	3168 80 or 132/24/1 12 No 128 ASCII 7 x 9 dot matrix P4 white std.; P31 green/amber opt. No Std. Std. Std. Std. No Up/down/jump/sm. No Std. Both std. No No 3 std. Fwd./back std. No No Line/screen/char./ window	3168 80 or 132/24/1 24/132 x 80 14 Std. 96 ASCII 7 x 9 dot matrix P4 white std.; green/amber opt. No Std. Std. No Std. Both std. No No 3 std. Fwd./back std. No No Line/screen/char./ window
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, data entry 94 EBCDIC Std. 24 std. Std.	Typewriter 128 ASCII Std. Prog. Std.	Typewriter 128 ASCII Std. 16 std. Std.	Typewriter 128 ASCII Std. 16 std. Std.	Typewriter 96 ASCII Std. 4 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	32/120 cps impact No No Std. —	No No No Std. —	50-19.2K bps 50-19.2K bps No Std. —	50-19.2K bps 50-19.2K bps No Std. —	50-19.2K bps 50-19.2K bps No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Synchronous BSC EBCDIC 2400-9600 Block Std. RS-232-C No No	Half/full-duplex Async./sync. TDI, TTY ASCII Up to 9600 Char./block Std. RS-232-C No No	Half/full-duplex Asynchronous ANSI/ASCII ASCII Up to 19,200 Char./line/block No RS-232-C, 20mA std. No No	Half/full-duplex Asynchronous ANSI/ASCII ASCII Up to 19,200 Character No RS-232-C, 20mA std. No No	Half/full-duplex Asynchronous ANSI/ASCII ASCII 50-19,200 Character No RS-232-C/20mA std. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	181 — 3,450 — 25 1/82 — — Carterfone	— — 1,795 — — — — Carterfone	— — 1,195 — — 6/81 9/81 — Western Union	— — 1,495 — — 6/80 12/80 — Western Union	— — 1,495 — — 6/83 — — Western Union
COMMENTS			Lease plans avail- able from authorized distributors	Lease plans avail- able from authorized distributors. Gra- phics, power supply and other expansion options available	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	CIE Terminals CIT-161	Cobar 3100	Cobar 3132	Cobar 3830	Computer Communications (CCI) Group 8000
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. DEC VT100/VT52	Stand-alone — No No No DEC VT100/ VT101/VT102	Stand-alone — No No No DEC VT131/VT132	Stand-alone 1 No No No Burroughs TD 830/ MT 983	Cluster Up to 240 No — — —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920, 3168 — 24 x 80, 24 x 132	3168 4K 24 x 80; 24 x 132	3168 4K 24 x 80; 24 x 132	2000, 3300 80 or 132/25/2 or 8 25 x 80 or 132	1920 — 24 x 80 plus status line
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 No 128 ASCII 7 x 9 dot matrix	12 No 127 ASCII 7 x 10 dot matrix P4 white std.; P31 grn/P134 amber opt.	15 No 127 ASCII 7 x 10 dot matrix P4 white std.; P31 grn/P134 amber opt.	15 No 128 ASCII 7 x 9 dot matrix Green std., white or amber opt.	12 No 128 7 x 10 dot matrix —
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	8 colors std. Std. Std. Std. No No Std. Std. Std. No Std. Both std. — 3 std. Std. No No Std.	No Std. Std. No Std. Std. Std. Up/down/smooth 1 std.; 3 opt. Std. Both std. No 3 std. Fwd. std. Std. Std. Line/screen std.	No Std. Std. No Std. Std. Std. Up/down/smooth 1 std.; 3 opt. Std. Both std. Std. Std. 3 std. Fwd./back std. Std. Std. Line/screen std.	No Std. Std. Std. Std. Std. Std. Up/down std. 2 std.; 8 opt. Std. Both std. Std. Std. No Fwd./back tab std. Std. Std. Line & screen std.	No Std. Std. Std. Half intensity Std. No No Std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 4 std. Std.	Typewriter 128 ASCII Std. 18 std. Std.	Typewriter 128 ASCII Std. 18 std. Std.	Typewriter, data entry 128 ASCII Std. 14 std. Std.	IBM 3278 EBCDIC/ASCII Std. 24 Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	50-19.2K bps 50-19.2K bps — Std. —	No No Opt. Std. —	No No Opt. Std. —	No No No Std. —	120 cps impact No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ANSI/ASCII ASCII 50-19,200 Character No RS-232-C/20mA No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C, 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C, 20mA opt. No No	Half duplex Async./sync. Burroughs ASCII 50-19,200 Char./block Std. RS-232-C/BDI/ TDI No	Half/full-duplex Synchronous SDLC EBCDIC Up to 1.544M Character Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 2,595 — — 6/82 — — Western Union	Purchase only — 1,395 — — 4/81 5/81 650 Cobar	Purchase only — 1,595 — — 10/80 1/81 400 Cobar	— — 1,995 — — 11/82 11/82 50 Cobar	66 194-225 1,500 4,990-5,775 15-25 — 1/84 — CCI
COMMENTS					

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Control Concepts EM-3275	Control Concepts EM-3276	Control Concepts CC-3276	Control Data Model 714	Control Data Model 721
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 Yes 3275-BSC No —	Stand-alone/cluster 8 Yes 3276-BSC No —	Stand-alone 8 Yes 3276-SDLC No —	Either 15 No No No —	Stand-alone 1 No No Std. CDC 722
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 8K 24 x 80, plus status line 12; 15 opt. Swivel opt. 96 EBCDIC 5 x 7 dot matrix P42 green No No No Std. Std. No No No No No Std. Std. Std. Std. Std. Std. Std. Std. Std. Char./field/screen std.	1920 12K 24 x 80, plus status line 12; 15 opt. Swivel opt. 96 EBCDIC 5 x 7 dot matrix P42 green No No No Std. Std. No No No No No Std. Std. Std. Std. Std. Std. Std. Std. Char./field/screen std.	1920 12K 24 x 80, plus status line 12; 15 opt. Swivel opt. 96 EBCDIC 5 x 7 dot matrix P42 green No No No Std. Std. No No No No No Std. Std. Std. Std. Std. Std. Std. Std. Char./field/screen std.	1280, 1920 2560, 3940 char. 16 x 80, 24 x 80 8 x 10 No 96 5 x 9 dot matrix P4 white No Std. No No No No Both std. Std. Std. Std. Std. Std. Std. Char./screen std.	2400, 3960 — 30 x 80, 30 x 132 15 Tilt and swivel std. 96 ASCII 8 x 16, 5 x 16 P39 green No Std. Std. Std. No Std. Up std. 1 std. Std. Both std. Std. Std. Std. Std. Std. Std. Char./screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	IBM 3278 96 EBCDIC/ASCII Std. 24 std. Std.	IBM 3278 96 EBCDIC/ASCII Std. 24 std. Std.	IBM 3278 96 EBCDIC Std. 24 std. Std.	Typewriter ASCII No 8 Std.	Typewriter ASCII Yes 15 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	180 cps d.m. or l.q. No Opt. Opt. Audible alarm	180 cps d.m. or l.q. 100 lpm Opt. Opt. Audible alarm	180 cps d.m. or l.q. 180 lpm Opt. Opt. Audible alarm	180 cps No No Std. Audible alarm	40/55/150 cps No No Std. Audible alarm, touch panel
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half-duplex Synchronous BSC EBCDIC/ASCII Up to 9600 Block Std.; contention opt. RS-232-C Opt. No	Half-duplex Synchronous BSC EBCDIC/ASCII Up to 9600 Block Std. RS-232-C Opt. No	Half-duplex Synchronous SDLC EBCDIC Up to 9600 Block Std. RS-232-C Opt. No	Half/full-duplex Synchronous ASCII, CDC ASCII 2000-9600 Block Std. RS-232-C No No	Half/full-duplex Asynchronous ASCII, TTX ASCII 110-19,200 Char./block No RS-232-C Opt. No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	128 Included 2,500-3,490 Included 32 6/80 9/80 Control Concepts, third party	138 Included 2,600-3,590 Included 35 6/80 9/80 Control Concepts, third party	179 Included 3,350-4,340 Included 42 3/82 6/82 Control Concepts, third party	112-284 4,490-10,108 — 53-82 5/78 5/78 Over 500 Control Data	126/180 (1 yr.) 2,295/3,295 — 31/43 4/82 6/82 Over 500 CDC
COMMENTS					721-20 Basic TTY 732-30 Basic TTY & PLATO/Graphics Three maintenance options: On-Site; Mail-in to service center; Customer self-maintenance

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Control Data Model 722	CTi Data Corporation CTi 1000A	CTi Data Corporation CTi 3078	Data General Dasher D210/D211	Data General Dasher D280C
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. Control Data	Stand-alone — No IBM 2740/1, /2 No None	Cluster 16 No IBM 3278/2 No None	Stand-alone 16 No No Std. DG D100/D200, ANSI X3.64	Stand-alone 1 No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80 12 No 96 ASCII 8 x 10 dot matrix P4 white No Std. Std. No Std. No No Up/down std. 1 std. Std. Both std. No Std. No Std. Std. Std. No	1920 20K 24 x 80 12 Tilt 64 5 x 7 dot matrix Green No No No No No Yes No No No Std. Std. No Char. std.	1920 1 page 24 x 80 12 Tilt 64 7 x 9 dot matrix Green No No No Std. Std. No No No No No No Fwd./back std. Std. Std. Std.	1920 — 24 x 80 12 Tilt std. 128; 256 7x11 in 10x12 cell P31 green No Std. Std. No Dim std. Std. No Up std. No No Both std. No No No Std. No No Line/screen std.	1920 — 24 x 80 13 Std. 96 ASCII 7 x 10 dot matrix Color screen 8 colors std. Std. Std. No Std. Std. No Up std. No No Both std. No No No Std. No No Line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter ASCII No 12 Std.	Typewriter 64 Std. 15 std. Std.	Typewriter 64 Std. 24 std. No	Typewriter 128 ASCII Std. 15 std. Std.	Typewriter 128 ASCII Std. 15 Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	150 cps No No Std. Audible alarm	80 & 180 cps No No Std. 55 cps docu. printer	180 cps No No No 55 cps docu. printer	No No No Std. (D211 only) —	No No No Opt. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII, TTY ASCII 110-9600 Character No RS-232-C No No	Half/full-duplex Asynchronous IBM 2740 EBCDIC To 1800 bps Block Std. RS-232-C No No	Half/full-duplex Synchronous BSC/SNA-SDLC EBCDIC To 9600 bps Character Std. RS-422 No No	Full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C; RS-422, 20mA (D211) No No	Full-duplex Asynchronous ASCII ASCII Up to 19,200 Character No RS-232-C, 20mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	74 (1-yr.) — 1,375 — 19 2/81 2/81 Over 3000 Control Data	— — 2,350 — 25 6/82 7/82 500 TRW	— — 1,250 6,400 14 3/83 4/83 — —	Purchase only — 995/1,195 — 13/15 5/83 7/83 — Data General	— — 3,750 — — 8/81 — — Data General
COMMENTS					Lease and rental available via third parties and terminal resellers

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Data General Dasher D410	Data General Dasher D460	Datamaxx Datamaxx Series	Datamaxx Maxxima Series	Datamedia Excel 10/20
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 16 No No Std. DG D400, ANSI X3.64	Stand-alone 16 No No Std. DG D400, ANSI X3.64	Stand-alone — No 3275/3276 BSC Std. See comments	Stand-alone — No No Std. See comments	Stand-alone 1 No No Std. DEC VT100
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1944, 3240 — 24 x 81, 24 x 135	1944, 3240 — 24 x 81, 24 x 135	2000 2 pages 25 x 80	2000 2 pages 25 x 80	1920, 1848, 3168 132/24/1 24 x 80, 14 x 132, 24 x 132 12; 14 opt. Tilt std. 128 ASCII
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 Tilt std. 256 7x11 in 10x12 cell P31 green	12 Tilt std. 256 7x11 in 10x12 cell P31 green	12 std.; 15 opt. Opt. 128 ASCII/EBCDIC 7 x 11 dot matrix P4 white std.; P31 grn/P34 amber opt. No	12 No 128 ASCII 7 x 11 dot matrix P31 green std.; P4 wh./P34 amber opt. No	7 x 9 dot matrix P4 white std. P31 green opt. No
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	No Std. Std. No Dim std. Std. No Up std. No Std. Both std. Std. No 24 std. Std. Std. Std. Line/screen/window std.	No Std. Std. No Dim std. Std. No Up std. No Std. Both std. Std. No 24 std. Std. Std. Std. Line/screen/window std.	Std. Std. Std. Std. Std. Std. No Up std. 2 std. Std. Both std. Std. Std. No Fwd./back/fix/var. Std. Std. Char./line/screen std.	Std. Std. Std. Std. Std. Std. Std. Up/down std. 2 pages std. Std. Std. Std. No Fwd./back/fix/var. Std. Std. Char./line/screen std.	Std. Std./opt. (20) No Std./opt. (20) Std. Std. Both std. No No 1 std. Fwd. std. No No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys	Typewriter 128 ASCII Std. 15 std.	Typewriter 128 ASCII Std. 15 std.	Typewriter 128 ASCII Opt. No	Typewriter 128 ASCII Std. 15 std.	Typewriter 64 ASCII Std. 4 std.
Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Std. No No No Std. —	Std. No No No Std. —	Std. 340 cps matrix 600 lpm band No Std. —	Std. 340 cps matrix 1000 lpm band No Std. —	Std. No No Opt. Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Full-duplex Asynchronous ASCII ASCII 110-19,200 Character No RS-232-C, RS-422, 20mA No No	Full-duplex Asynchronous ASCII ASCII 110-19,200 Character No RS-232-C, RS-422, 20mA No No	Half-duplex Async./sync. Poller ASCII 50-9600 Char./line/block Std. RS-232-C, TDI std.	Half-duplex Async./sync. Poller ASCII 50-19,200 Char./line/block Std. RS-232-C, TDI std.	Half/full-duplex Asynchronous X on/X off ASCII/ANSI 50-19,200 Character No RS-232-C; 20mA opt. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Purchase only — 1,635 — 17 5/83 7/83 — Data General	Purchase only — 1,835 — 19 5/83 7/83 — Data General	— — 1,670-2,250 — 37 — 2/79 Over 5000 Datamaxx; Dow Jones Compatible with Burroughs TD 830; MT 983; NCR 796- 501; Honeywell 7700; Tandem B52; IBM 3275/3276. Quantity discounts available	— — 1,800-2,450 — 37 — 8/81 — Datamaxx; Dow Jones Compatible with Burroughs TD 830; MT 983; NCR 7900/3; DEC VT 100; VT 52. Quantity discounts available	— — 1,215-1,495 — — — — — RCA Service Co.
COMMENTS		Alphanumeric and character-mapped graphics terminal; additional 3572 user-defined characters/symbols available			

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Datamedia Excel 30	Datamedia Excel 40	Datamedia Excel 50/60	Datamedia Excel 70	Datamedia ColorScan 10
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. See comments	Stand-alone 1 No No Std. TeleVideo 950	Stand-alone 1 No No Std. DEC VT100 APL/ VT132	Stand-alone 1 No No Std. DG Dasher D200	Stand-alone 1 No No Std. DEC VT100
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920, 1848(3168 opt.) 132/24/1 24 x 80, 14 x 132, (24 x 132 opt.) 12; 14 opt. Tilt std. 128 ASCII 7 x 9 dot matrix P4 white std. P31 green opt. No Std. Std. No Std. Std. Std. Std. Up/down std. No Std. Both std. No No 1 std. Fwd. std. No Std. Char./line/screen std.	1920, 960, 480 1920/24/2 24 x 80, 24 x 40, 12 x 40 12; 14 opt. Tilt std. 96 ASCII + 32 cts. 5 x 7 dot matrix P4 white std.; P31 green opt. No Std. Std. Std. Std. Up/down std. 2 std. Std. Both std. Std. Std. 1 std. Fwd./back std. Std. Std. Char./line/screen std.	1920, 3168 132/24/1 24 x 80, 24 x 132 12; 14 opt. Tilt std. APL/128 ASCII 7 x 9 dot matrix P4 white std.; P31 green opt. No Std. Std. Std. Std. Up/down std. No Std. Both std. No No 1 std. Fwd. std. No Std. Char./line/screen std.	1920, 3168 132/24/1 24 x 80, 24 x 132 12; 14 opt. Tilt std. 128 ASCII 7 x 9 dot matrix P4 white std.; P31 green opt. No Std. Std. Std. Std. Up/down std. No Std. Both std. No No 1 std. Fwd. std. No Std. Char./line/screen std.	1920, 3168 132/24/1 24 x 80, 24 x 132 12 Tilt std. 128 ASCII 7 x 9 dot matrix Color screen 8 colors std. Std. Std. No Std. Std. Std. Up/down std. No Std. Both std. No No 1 std. Fwd. std. No No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 64 ASCII Std. 8 opt. Std.	Typewriter 64 ASCII Std. 32 std. Std.	Typewriter 64 ASCII Std. 12 std. Std.	Typewriter 64 ASCII Std. 12 std. Std.	Typewriter 64 ASCII Std. 12 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII 50-19,200 Character No RS-232-C; 20mA opt. No No	Half/full-duplex Asynchronous X on/X off ASCII 110-19,200 Char./line/block No RS-232-C No No No	Half/full-duplex Asynchronous X on/X off ASCII/ANSI 50-19,200 Char./line/block No RS-232-C;20mA opt. No No	Half/full-duplex Asynchronous X on/X off ASCII 50-19,200 Character No RS-232-C;20mA opt. No No	Half/full-duplex Asynchronous X on/X off ASCII 50-19,200 Character No RS-232-C;20mA opt. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,215-1,300 — — — — — RCA Service Co.	— — 995-1,080 — 11/81 — — RCA Service Co.	— — Contact vendor — — — — RCA Service Co.	— — 1,395-1,480 — 10/81 — — RCA Service Co.	— — 2,795 — — — — RCA Service Co.
COMMENTS	Emulations include: Datamedia 1521, ADDS Regent 25, Hazeltine 1420, Lear Siegler ADM 3A		Excel 50 is APL model		

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Datamedia ColorScan 30	Datamedia ColorScan 60	Datamedia ColorScan 70	Datamedia 3270-S	Datamedia Excel 3270-6/3270-8
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. See comments	Stand-alone 1 No No Std. DEC VT132	Stand-alone 1 No No Std. DG Dasher D200	Stand-alone 1 No 3275/3276-BSC Opt. —	Cluster 3 No 3276/3278 BSC No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920, 3168 132/24/1 24 x 80, 24 x 132 12 Tilt std. 128 ASCII 7 x 9 dot matrix Color screen 8 colors std. Std. Std. No Std. Std. Std. Std. Up/down std. No Std. Both std. No Std. 1 std. Fwd. std. No Std. Char./line/screen std.	1920, 3168 132/24/1 24 x 80, 24 x 132 12 Tilt std. 128 ASCII 7 x 9 dot matrix Color screen 8 colors std. Std. Std. No Std. Std. Std. Std. Up/down std. No Std. Both std. No Std. 1 std. Fwd. std. Std. Std. Char./line/screen std.	1920, 3168 132/24/1 24 x 80, 24 x 132 12 Tilt std. 128 ASCII 7 x 9 dot matrix Color screen 8 colors std. Std. Std. No Std. Std. Std. Std. Up/down std. No Std. Both std. No Std. 1 std. Fwd. std. No Std. Std. Char./line/screen std.	1920 80/24/1 24 x 80 14 Tilt std. 96 EBCDIC 7 x 9 dot matrix P31 green std. No No No No Std. No No No Std. Both std. Std. No No Std. Std. Std. Screen std.	1920 — 24 x 80 14 std.; 12 opt. Tilt std. 96 EBCDIC 7 x 9 dot matrix P31 green std. P4 white opt. No No No No Std. Both std. Std. No No Std. Std. Std. Screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 64 ASCII Std. 8 std. Std.	Typewriter 64 ASCII Std. 12 std. Std.	Typewriter 64 ASCII Std. 12 std. Std.	Typewriter 96 EBCDIC Std. 24 std. Std.	Typewriter 96 EBCDIC Std. 24 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII 50-19,200 Character No RS-232-C;20mA opt. No No	Half/full-duplex Asynchronous X on/X off ASCII 50-19,200 Char./line/block No RS-232-C;20mA opt. No No	Half/full-duplex Asynchronous X on/X off ASCII 50-19,200 Character No RS-232-C;20mA opt. No No	Half-duplex Synchronous BSC EBCDIC 110-19,200 Block Std. RS-232-C Opt. No	Half-duplex Synchronous BSC EBCDIC 1200-9600 Block Std. RS-232-C Opt. No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— 2,795 — — 11/81 — — RCA Service Co.	— 2,999 — — 11/81 — — RCA Service Co.	— 2,795 — — 11/81 — — RCA Service Co.	— 1,995 — 24 3/82 4/82 — RCA Service Co.	— 1,695-2,895 — — 6/82 — — RCA Service Co.
COMMENTS	Emulations include: Datamedia 1521, ADDS Regent 25, Hazeltine 1420, Lear Siegler ADM 3A				

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Datapoint 8220	Datavue Displaymaster 132-C	Decision Data 3751-11	Decision Data 3791-01	Delta Data D20
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone Variable No W/Datapoint proc. Std. —	Stand-alone 1 No No Std. Over 20 program- mable	Either Up to 9 No 5251-11 No —	Either 9 No IBM 5291 No IBM 5251-1, -11	Stand-alone — No 3270 Std. Burroughs TD830, MT985
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 80/24/1 24 x 80 12 No 96 ASCII 7 x 9 Amber/white No No No Std. Std. No Std. No Std. No Std. No Std. Both std. Opt. No Std. Std. Via program control Via program control Via program control	3168 32K 24 x 80; 24 x 132 11 3/4 x 5 3/4 No 128 ASCII 5 x 9 dot matrix P31 green std.; P4 white, amber opt. No Opt. Opt. Opt. No Std. Up/down std. 8(80 col;) 5(132col) Std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	1920 — 24 x 80 plus status line 15 Tilt std. 96, MNC-188 8 x 16 dot matrix P39 green No Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std.	1920 — 24 x 80 12 Tilt 96/188 7 x 9 dot matrix Green No Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std.	1920 13K 24 x 80 plus status lines 12 Std. 128 ASCII 7 x 9 dot matrix P31 green No Std. Std. Std. Std. Up/down std. 12 std. Std. Both std. Std. No No Fwd./back std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 96 ASCII Std. 5 std. Std.	Typewriter 128 ASCII Std. 16 std. Std.	Typewriter, data entry EBCDIC Std. 24 std. Std.	Typewriter 16/188 MNC EBCDIC Std. 24 std. Std.	Typewriter 128 ASCII Std. No —
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	Opt. Opt. Opt. Std. Light pen	6541-07 150 cps opt. Std. No No Light pen, mag card, ROR keylock	6541-07 150 cps opt. No No No No	No No No — —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII 50-9600 Character No RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block Opt. RS-232-C, 20mA opt. No No	Half-duplex Synchronous BSC/SDLC EBCDIC Block Std. Twinax phase-encoded	Half-duplex Std. BSC/SDLC EBCDIC 1M Block Std. Twinax, phase-encoded	Half-duplex Async./synch. Burroughs TDI ASCII Up to 9600 Char./block Std. RS-232-C std. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	85 Contact vendor — — — 11/81 — Datapoint	Purchase only 1,795 — — 12/79 1/80 1,000 Third party	98 — 2,175 — 21 10/80 1/81 25,000 Decision Data	Purchase only — 1,810 — 215/yr. 7/83 7/83 1,000 Decision Data	Contact vendor — — — — 6/83 6/83 — Delta Data, Western Union
COMMENTS	Tilt/rotate base available; any key can be programmed as a special func- tion control	Z-80 microprocessor std.; two RS-232-C ports std.; 24 stan- dard instructions			Dual-processor with file transfer ability, poll/select protocol

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Delta Data 2830-II	Dentronix 200	Dentronix 209	Dentronix 400	Digital Equipment (DEC) VT100
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either — No No Std. Burroughs TD830, MT985	Stand-alone 1 No No Std. Data General D200	Stand-alone 1 No No Std. Data General D200	Stand-alone 1 No No Std. Data General D400	Stand-alone 1 No No Std. VT100
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1920 char (4000 opt) 24 x 80 plus status line 12 Std. 136 7 x 9 dot matrix P31 green No Std. Std. Std. Std. Std. No Up/down std. 12 std. Std. Both std. Std. No No Fwd./back std. Std. Std. Char./line/screen std.	1920 2000/25/1 24 x 80 plus status line 12; 15 opt. Tilt/swivel std. 96 ASCII 7 x 11 dot matrix P4 white/P31 green; amber opt. No Std. Std. No Std. Std. No Up std. No Opt. Both std. No No Std. No No Line/screen std.	1920 2000/25/1 24 x 80 plus status line 12; 15 opt. No 96 ASCII 7 x 11 dot matrix P4 white/P31 green; amber opt. No Std. Std. No Std. Std. No Up std. No Opt. Both std. No No Std. No No Line/screen std.	3240 max. 7776/48/2 std. 24 x 81/135 plus status line 12; 15 opt. Tilt/swivel std. 256 plus graphics 10 x 12 dot matrix P4 white/P31 green; amber opt. No Std. Std. No Std. Std. U,D,L,R, smooth std. 2 std., 8 opt. Std. plus selc. fmt. Both std. Std. 1-24 std. Std. Std. Screen/window/ unprotect/line	1920; 3168 opt. — 24 x 80; 24 x 132 opt. 12 Opt. 128 ASCII 7 x 9 dot matrix P4 white std. No Std. Opt. No Opt. Std. Std. Smooth/bidir. No Std. Both std. No Std. 2 std. Std. & program tabs Opt. Opt. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys	Typewriter, data entry 128 ASCII Std. No	Typewriter 128 ASCII Std. 19 std.	Typewriter 128 ASCII Std. 19 std.	Typewriter 128 ASCII Std. 19 std.	Typewriter ASCII Std. 4 std.
ANCILLARY DEVICES Numeric keypad Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Std. No No No Std. Audible alarm	Std. Std. interface Any RS-232-C No Printer port std. No	Std. No No No No No	Std. Std. interface Any RS-232-C No Printer port std. No	Std. 30-240 cps impact — Std. Opt. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Async./synch. Burroughs TDI ASCII Up to 9600 Char./block Std. RS-232-C std. No No	Full-duplex Asynchronous ASCII ASCII Up to 19,200 Character No RS-232-C, 20mA std. No No	Full-duplex Asynchronous ASCII ASCII Up to 19,200 Character No RS-232-C std. std. No No	Full-duplex Asynchronous ASCII ASCII Up to 19,200 Character No RS-232-C, 20mA std. No No	Full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C, 20mA opt. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	See comments — 2,150 — — — 9/79 Over 1,000 Delta Data & Sorbus Leasing available through distributors	Purchase only — 1,250 — — 1/82 1/82 3rd party	Purchase only — 895 — — 10/83 1/83 3rd party	Purchase only — 1,450 — — — 11/82 1/83 3rd party	— — 1,945 — — 18 1978 1978 DEC
COMMENTS		Printer interface standard with full transparent pass through capability. Optional 15" CRT available desig- nated 215		Printer inter. std. Bit mapped thin and wide graphics std. double width and height charac- ters std. Opt. 15" CRT available desig- nated 415. Non- volatile parameter RAM std.	ANSI std. escape sequences; line drawing set std., industrial-enclosure model (RT100) avail- able; also available with LSI-11 back- plane (VT103)

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Digital Equipment (DEC) VT101	Digital Equipment (DEC) VT102	Digital Equipment (DEC) VT125	Digital Equipment (DEC) VT131	Direct 820
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. VT100	Stand-alone 1 No No Std. VT100	Stand-alone 1 No No Std. VT100	Stand-alone 1 No No Std. VT100	Stand-alone 1 Portable case No No HP2640, HP2645A, HP2622
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80; 14 x 132 12 Opt. 128 ASCII 7 x 9 dot matrix P4 white std. No Std. No No No Std. Std. Smooth/bidir. No Std. Both std. No Std. 2 std. Std. & program tabs No No Char./line/screen std.	3168 — 24 x 80; 24 x 132 12 Opt. 128 ASCII 7 x 9 dot matrix P4 white std. No Std. No No No Std. Std. Smooth/bidir. No Std. Both std. No Std. 2 std. Std. & program tabs Std. Std. Char./line/screen std.	1920; 3168 opt. — 24 x 80; 24 x 132 12 Opt. 128 ASCII 7 x 9 dot matrix P4 white std. 4 of 64 ext. monitor Std. Opt. No No Opt. Std. Std. Smooth/bidir. No Std. Both std. No Std. 2 std. Std. & program tabs No No Char./line/screen std.	3168 — 24 x 80; 24 x 132 12 Opt. 128 ASCII 7 x 9 dot matrix P4 white std. No Std. Std. Std. Std. Smooth/bidir. No Std. Both std. Std. Std. 2 std. Std. & program tabs Std. Std. Char./line/screen std.	1920 4.2K 24 x 80 12 No 128 ASCII 7 x 11 dot matrix P4 white No Std. Std. Std. Std. No Bidir.; 3 rates Mult. pages std. No Both std. Std. Std. Std. Fwd./back tab Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter ASCII Std. 4 std. Std.	Typewriter ASCII Std. 4 std. Std.	Typewriter ASCII Std. 4 std. Std.	Typewriter ASCII Std. 4 std. Std.	Typewriter 96 ASCII Std. 8 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	30-240 cps impact Std. No —	30-240 cps impact Std. Std. —	30-240 cps impact Std. Std. Graphics printer	30-240 cps impact Std. Std. —	No No No Std. No
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C, 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C, 20mA opt. No No	Full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C, 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C, 20mA opt. No No	Half/full-duplex Asynchronous DC1/DC2; Eng. Ack. ASCII 50-19,200 Char./line/block No RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,350 — 15 9/81 10/81 — DEC	— — 1,710 — 22 9/81 10/81 — DEC	— — 3,800 — 29 7/81 10/81 — DEC	— — 1,825 — 22 9/81 10/81 — DEC	— — 1,495 — 24 4/83 6/83 — Contact vendor
COMMENTS	ANSI std. escape sequences; line drawing set std.; local echo; national power cords; bounded	ANSI std. escape sequences; line drawing set std.; local echo; national power cords; international modem support; bounded; industrial-enclosure model (RT102) available	Same as VT100 plus bit map graphics for business & scientific users	ANSI std. escape sequences; line drawing set std.; local echo; national power cords; international modem support; bounded	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Direct 825	Direct 828/1	Direct 831	Epic 14E	Esprit Systems Esprit
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by COMMENTS	Stand-alone 1 Portable case No No HP2640, HP2645A, HP2622 1920, 3168 16K std.; 32K opt. 24 x 80; 24 x 132 12 No 128 ASCII 7 x 11 dot matrix P4 white/P31 green No Std. Std. Std. Std. Std. No Bidir.; 3 rates Mult. pages std. No Both std. Std. Std. Std. Fwd./back tab Std. Std. Char./line/screen std. Typewriter 96 ASCII Std. 8 std. Std. No No No Std. Modem opt., plot 10 graphics opt. Half/full-duplex Asynchronous DC1/DC2; Eng./Ack. ASCII 50-19,200 Char./line/block No RS-232-C Opt. No Purchase only — 1,890 — 24 7/81 7/81 — Contact vendor HP line-drawing set; fold-up keyboard; user-adjustable convenience fea- tures; upgrade to CP/M computer system opt.; screen-labeled function keys	Stand-alone 1 Portable case No No HP2640, HP2645A, DEC VT100/VT52 1920, 3168, 3696 32K 24 x 80; 24 x 132; 28 x 132 12 No 128 ASCII 7 x 11 dot matrix P4 white/P31 green No Std. Std. Std. Std. Std. No Bidir.; 3 rates Mult. pages std. No Both std. Std. Std. Std. Fwd./back tab Std. Std. Char./line/screen std. Typewriter 96 ASCII Std. 8 or 16 std. Std. No No No Std. Modem opt., plot 10 graphics opt. Half/full-duplex Asynchronous DC1/DC2; Eng./Ack. ASCII 50-19,200 Char./line/block No RS-232-C Opt. No Purchase only — 2,790 — 24 3/81 4/81 — Contact vendor Same as 825 plus downline loadable fonts	Stand-alone 1 Portable case No No DEC VT100/VT131/ VT52 1920, 3168, 3696 16K std.; 32K opt. 24 x 80; 24 x 132; 28 x 132 12 No 128 ASCII 7 x 11 dot matrix P4 white/P31 green No Std. Std. Std. Std. Std. No Bidir.; 3 rates Mult. pages std. No Both std. Std. Std. Std. Fwd./back tab Std. Std. Char./line/screen std. Typewriter 96 ASCII Std. 16 std. Std. No No No Std. Modem opt., plot 10 graphics opt. Half/full-duplex Asynchronous X-on/X-off, DTR ASCII 50-19,200 Char./line/block No RS-232-C Opt. No Purchase only — 1,395 — 24 11/82 11/82 — Contact vendor Full data entry check. & forms capa. downline load. char. fonts, line drawing set, fold-up kybd. All feat. & controls settable frm kybd & saveable in non- volatile RAM.	Stand-alone — Std. No Std. TeleVideo 925 1920 — 24 x 80 plus status line 14 Std. 128 ASCII & graph. 7 x 9 dot matrix P31 green No Std. Std. Dim std. Std. No Jump/smooth std. No Std. Both std. Std. Std. No Std. Std. Std. Std. Typewriter 128 ASCII Std. 11 std.; 22 function Std. No No No Std. — Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./block No RS-232-C No No — 995 — — 6/82 11/82 — Third party Communications modes keyboard-selectable; 64 block graphics & 16 line graphics; room for 2 addi- tional logic boards	Stand-alone 1 No No Std. ADDS Regent 25, Lear Siegler ADM3A 1920 No 24 x 80 12 No 128 7 x 11 dot matrix Green No No Std. No Std. No Std. No No Both std. Std. No No Std. No Std. Line/screen std. Typewriter 128 ASCII No No Std. Std. No No No Std. — Half/full-duplex Asynchronous TTY ASCII Up to 9600 Char./block No RS-232-C No No — 595 — — 6/81 — Esprit, TRW Low-cost buffered terminal

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Esprit Systems Esprit II	Esprit Systems Esprit III	Esprit Systems Esprit III Color	Esprit Systems ESP	Esprit Systems Executive 10
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. —	Stand-alone 1 No No Std. —	Stand-alone 1 No No Std. —	Stand-alone 1 No No Std. TeleVideo 925, Esprit II	Stand-alone 1 No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80 12 Tilt std. 128 ASCII 7 x 11 dot matrix Green No No Std. No Std. No No No No No Both std. Std. No No Std. No Std. Line/screen std.	1920 — 24 x 80 plus status line 12 Tilt std. 128 ASCII & graphics 7 x 11 dot matrix Green No Std. Std. Std. Dim std. Std. No No No Both std. Std. No No Std. Std. Std. Line/screen std.	1920 — 24 x 80 plus status line 13 Tilt std. 128 ASCII + graphics 7 x 11 dot matrix Green 8 colors std. No No No Dim std. Std. No No Std. Both std. Std. No No Std. Std. Std. Line/screen std.	2000 4 pages opt. 25 x 80 14 Std. 128 7 x 11 dot matrix P31 green No Std. Std. Std. Std. Smooth std. 4 opt. Std. Std. Std. Std. Fwd./back std. Std. Std. Std.	1920 1 page 24 x 80 plus status line 12 Std. 124 ASCII 7 x 10 dot matrix Green No No Std. Std. Std. No No 1 page std. Std. Both std. Std. Std. No Std. Std. Std. Std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. No Std.	Typewriter 128 ASCII Std. 22 std. Std.	Typewriter 128 ASCII Std. 22 std. Std.	Typewriter 128 ASCII Std. 22 Std.	Typewriter 124 ASCII Std. 8 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	No No No Std. —	No No No Std. —	No No No Std. —	No No No Opt. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format: character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous TTY ASCII 50-19,200 Char./block No RS-232-C No No	Half/full-duplex Asynchronous TTY ASCII 50-19,200 Char./block No RS-232-C No No	Half/full-duplex Asynchronous TTY ASCII 50-19,200 Char./block No RS-232-C No No	Half/full-duplex Asynchronous TTY — 50-19,200 Char./block No RS-232-C, 20mA No No	Half/full-duplex Asynchronous — ASCII 110-19,200 Char./block No RS-232-C, 20mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 645 — — 6/82 — — Esprit, TRW	— — 895 — — 9/82 10/82 — Esprit, TRW	— — 995 — — 5/83 — — Esprit, TRW	— — 699 — — 11/83 12/83 — Esprit, TRW	— — 1,195 — — 6/82 — — Hazeltime & Western Union
COMMENTS					

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Esprit Systems Executive 10/25	Esprit Systems Executive 10/51	Esprit Systems Executive 10/78	Esprit Systems Executive 10/102	Falco Endura
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. Executive Model 20	Stand-alone — No 5251 Std. —	Stand-alone — No 3278 Std. —	Stand-alone 1 No No Std. DEC VT102/VT131	Stand-alone 1 No No Std. Lear Siegler ADM 31
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 — 25 x 80 14 Std. 128 7 x 10 dot matrix P31 green No Std. Std. Std. Std. Std. Std. Smooth std. No Std. Std. Std. Std. 3 Fwd./back std. Std. Std. Std.	1920 — 24 x 80 plus status line 12 Std. 124 ASCII 7 x 10 dot matrix P146 green No Std. Std. No Std. Std. No No Std. Both std. Std. Std. Std. Std. No Std. Std. Line/screen std.	1920 — 24 x 80 plus status line 12 Std. 124 ASCII 7 x 10 dot matrix P146 green No Std. Std. No Std. Std. No No Std. Both std. Std. Std. Std. 3 Fwd./back std. Std. Std. Line/screen std.	1920 — 34 x 80 14 Std. 128 7 x 10 dot matrix P31 green No Std. Std. No Std. Std. Smooth std. No Std. Both std. Std. Std. 3 Fwd./back std. Std. Std. Std.	1920 — 24 x 80 12 — 128 ASCII+graphics 7 x 9 dot matrix P31 green std.; P4 wh., PC134 amb. opt. No Std. Std. Std. No Std. No Smooth std. No Std. Std. Std. — No Std. Std. Std. Line/page std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 32 Std.	IBM 5251 124 ASCII Std. 8 std. Std.	IBM 3278 124 ASCII Std. 12 Std. Std.	Typewriter 128 ASCII Std. No Std.	Typewriter 128 ASCII Std. — —
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	No No No Std. —	No No No Std. —	No No No Std. —	No No Opt. Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous TTY ASCII 110-19,200 Char./block No RS-232-C, 20mA No No	Half/full-duplex Asynchronous — ASCII 110-19,200 Block No RS-232-C, 20mA No No	Half/full-duplex Asynchronous — ASCII 110-19,200 Block No RS-232-C, 20mA No No	Half/full-duplex Asynchronous TTY ASCII 80-19,200 Char./block No RS-232-C, 20mA No No	Half/full-duplex Asynchronous ANSI X3.64 ASCII 50-19,200 Char./block No Dual RS-232-C; RS-422, CL opt. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,045 — — 10/83 12/83 — Esprit, TRW	— — 1,095 — — 5/83 — — Esprit Systems & Western Union Emulates IBM 5251 when used with protocol converter	— — 1,150 — — 5/83 — — Esprit Systems & Western Union Emulates IBM 3278 Model 2 when used with protocol converter.	— — 995 — — 10/83 12/83 — Esprit, TRW	— — 695 — — 5/83 — — Dow Jones/factory
COMMENTS					

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Falco Fame 2/Fame 3	Falco Data Products TS-1	Falco TS-1SP	Falco TS-100SP	Falco TS-2
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No — Lear Siegler ADM 3A/ 31, DEC VT52 (2)	Stand-alone 1 No 3275 Std. DEC VT52 Lear Siegler ADM 31	Stand-alone 1 No No Std. —	Stand-alone 1 No No Std. DEC VT100/VT52	Stand-alone 1 No No Std. Lear Siegler ADM 2
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 4K opt(2);2K std.(3) 24 x 80 plus status line 12 std.; 15 opt. Yes 128 7 x 9 dot matrix P31 green std.; amber, white opt. — Std. (2 only) Std. (2 only) Std. Std. (2 only) Std. (2 only) Std. (2 only) Up/down std. — Std. Std. Std. (2 only) Std. (2 only) Std. (2 only) Std. Std. (2 only) Std. (2 only) Std. (2 only) Std. Std. (2 only) Std. (2 only) Std. (2 only)	1920 16K opt. 24 x 80 plus status line 12 Opt. 128 ASCII 6 x 10 dot matrix P31 green std.; P4 wht./PC134 amb. opt. No Std. Std. Std. Std. Std. Up/smooth std. Opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Line/page std.	1920 16K 24 x 80 12 No 128 ASCII 6 x 10 dot matrix P31 green std.; P4 wht./PC134 amb. No Std. Std. Std. Std. Std. Std. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Line/page std.	1920 1 page 24 x 80 12 No 128 ASCII 7 x 9 dot matrix P31 green std.; P4 wht./PC134 amb. No Std. Std. Std. Std. Std. Std. Std. 1 page Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Line/page std.	
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Typewriter 128 ASCII Std. 11 (2); 12 (3) Std. — — Opt. — —	Typewriter, data entry 128 ASCII Std. 28 std., separate row opt. Std. No No Std. Std.; 2 I/O ports —	Typewriter 128 ASCII Std. — Std. No No Opt. Std. —	Typewriter 128 ASCII Std. 7 std.; 14 func. Std. No No Opt. Std. — 212 plus modem	
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format: character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C std.; 20mA, RS-422 opt. (2 only) Opt. (2 only) — — — — — 9/83 11/83 — Dow Jones, factory	Half/full-duplex Async std., syn. opt SDLC ASCII 50-19,200 Char./line/block Opt. RS-232-C Opt. Auto dialer No — Purchase only — 1,295 — — 10/80 5,000 Dow Jones/factory	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./block Opt. RS-232-C std.; 20mA, RS-422 opt. No No — — 1,495 — — 6/82 — Dow Jones/factory	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./block Opt. RS-232-C std.; 20mA, RS-422 opt. No No — — 1,850 — — 6/82 — Dow Jones/factory	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C std.; 20mA opt. Opt. No — — 1,495 — — 1/83 1/83 — Dow Jones/factory
COMMENTS		Additional emula- tions include: DEC VT100, Burroughs, NCR, Data General, line & business graphics; hori- zontal/down scrolling opt.			

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Falco TS-42	Falco TSA-100	Falco TS-2624	General Digital VuePoint/ VuePoint Rack Mount	General Terminal SW 10
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. Lear Siegler ADM 42	Stand-alone 1 No No Std. DEC VT100/VT52	Stand-alone 1 No No Std. Hewlett-Packard 2624	Stand-alone 1 Portable case Special order Opt. —	Stand-alone — No No Std. DEC VT100/VT52
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 16K 24 x 80 12 No 128 ASCII 7 x 9 dot matrix P31 green std.; P4 wht./PC134 amb. No Std. Std. Std. Std. Std. Std. Std. Std. 3 pages std. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Line/page std.	1920, 3188 1 page 24 x 80, 24 x 132 12 No 128 ASCII 7 x 9 dot matrix P31 green std.; P4 wht./PC134 amb. No Std. Std. Std. Std. Std. Std. Std. 8 pages std. Std. Both std. No No Std. Fwd./back std. Std. Std. Line/page std.	1920 16K 24 x 80 12 No 128 ASCII 7 x 9 dot matrix P31 green std.; P4 wht./PC134 amb. No Std. Std. Std. Std. Std. Std. 8 pages std. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Line/page std.	480 — 12 x 40 10 No 96 ASCII 5 x 7 dot matrix Gas plasma panel No No Std. Std. Std. No Up std. 3 std.; up to 51 opt. Std. Addressable only Std. No No Fwd. std. No No Char./line/screen/ partial screen std.	1920 80/24/1 24 x 80 plus status line 12 No 96 ASCII 5 x 7 dot matrix P31 green std.; P4 white opt. No No No No Std. No Up/slow std. No Std. Both std. Std. No No Std. Fwd. std. Std. Std. Line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 44 std. Std.	Typewriter 128 ASCII Std. 14 std. Std.	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter opt. 128 ASCII Std. Via touch screen Via touch screen	Typewriter 96 ASCII Std. 12 std.; 20 char./ key Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Opt. Std. 212 plus modem	No No Opt. Std. 212 plus modem	No No Opt. Std. 212 plus modem	No No No Std.; 2 I/O ports Audible alarm std.	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block Opt. RS-232-C std.; 20mA opt. Opt. No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character Opt. RS-232-C std.; 20mA, RS-422 opt. Opt. No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block Opt. RS-232-C std.; 20mA opt. Opt. No	Full-duplex Asynchronous — ASCII 300-19,200 Character Opt. RS-232-C; 20mA opt. — —	Full-duplex Asynchronous ASCII ASCII 50-9600 Character No RS-232-C, 20mA — No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,695 — — 11/82 11/82 — Dow Jones/factory	— — 1,295 — — 12/82 12/82 — Dow Jones/factory	— — 1,995 — — 12/82 12/82 — Dow Jones/factory	— — 3,500 — — 9/79 — General Digital	— — 899 — — 5/81 9/81 — General Terminal
COMMENTS				The VuePoint is a touch-input terminal with optional keyboard & printer; a rack-mount version is available; packaged in a 19-inch rack compatible enclosure—\$3,950	11 international keyboards available

Alphanumeric Display Terminals

SUPPLIER AND MODEL	General Terminal SW 80	Harris 8000	Harris 9178	Harris 9200	Hewlett-Packard 2621B
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. None	Cluster 32 No 3270 BSC/SDLC No Burroughs, Honey- well, Sperry	Cluster 32 No 3178/3278 No —	Cluster 32 No 3270 BSC/SDLC No —	Stand-alone — No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 3840 per page 24 x 80 plus status line 12 No 224 5 x 7 dot matrix P31 green std.; P4 opt. No Std. Std. Std. No Std. Std. Horiz. & vert. std. 3 std.; 7 opt. Std. Std. Std. Std. Std. Std. Fwd./back std. Std. Std. Line, field, page	480, 960, 1920 — 12 x 40, 12 x 80, 24 x 80 12 No 96/128 ASCII 7 x 9 dot matrix P4 white No Std. Std. Std. Std. No Std. Std. No Std. Std. Char./line/screen Std.	1920 — 24 x 80 plus status line 12 No 128 9 x 14 dot matrix P39/P42 green, PC166 amber No No Std. Std. Std. Std. No Std. Std. Std. Std. Char./line/screen	960-3564 — 12/24/32/43 x 80, 27 x 132 15 — 128 7 x 13 dot matrix P39/P42 green, PC166 amber Yes No Std. No Std. Std. No No Std. Std. Std. Std. No Std. Std. Std. Std. —	1920 2 pages 24 x 80 12 Opt. 128 ASCII 7 x 9 dot matrix P4 white std.; P31 green opt. No Std. No No Std. No Std. No Up/down std. 2 std. Std. Both std. No Std. No Fwd./back std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 24 std. Std.	Typewriter, data entry, others ASCII/EBCDIC Std. Up to 36 Std.	Typewriter, data entry, keypunch ASCII/EBCDIC Std. Up to 24 Opt.	Typewriter, data entry, keypunch ASCII/EBCDIC Std. Up to 24 Opt.	Typewriter 128 ASCII Std. 8 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Opt. Std. None	Impact, 40-165 cps Belt, 200 lpm No Std. Hard disk	Impact, 80-180 cps Band, 300 lpm No Std. Light pen, magnetic stripe reader	Impact, 80-180 cps Band, 300 lpm No Std. Light pen, magnetic stripe reader	Opt. (integral) No No No —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C No No	Half/full-duplex Async./sync. BSC/SDLC ASCII/EBCDIC 1200-9600 Char./block Std. RS-232-C No No	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC Up to 9600 Char./block Std. RS-232-C No No	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC Up to 9600 Char./block Std. RS-232-C No No	Full-duplex Asynchronous ASCII ASCII 110-9600 Char./line No RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	Purchase only — 995 — — 11/81 2/83 — General Terminal	Contact vendor Contact vendor Contact vendor Contact vendor — 1976 4200 systems Harris	Contact vendor — 1,462-1,524 — Contact vendor 5/83 — Harris	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor — 5/80 — Harris	80 (18-mo.) — 1,295 — 18 12/81 — Hewlett-Packard
COMMENTS	Options: 11 int'l. keyboards, 32K memory, current loop, INIT, PROM, DA	An interactive terminal system with enhanced capabilities for local format storage & queued trans- action handling	For use with Harris 9200 Information Pro- cessing System	Personal computing optional	Optional integral thermal printer (\$1,210); 8 user- definable soft keys; screen-labelled function keys; user- adjustable bright- ness

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Hewlett-Packard 2622A	Hewlett-Packard 2623A	Hewlett-Packard 2624B	Hewlett-Packard 2626A	Hewlett-Packard 2382A
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. ANSI	Stand-alone — No No Std. Tektronix 4010, ANSI	Stand-alone — No No Std. —	Stand-alone — No No Std. —	Stand-alone — Portable case No Std. ANSI
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920 2 pages 24 x 80	1920 2 pages 24 x 80	1920 4 pages 24 x 80	1920 5 pages 24 x 80	1920 2 pages 24 x 80
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 Opt. 128 ASCII 7 x 11 dot matrix P4 white std.; P31 green opt.	12 Opt. 128 ASCII 7 x 11 dot matrix P4 white std.; P31 green opt.	12 Opt. 128 ASCII 7 x 11 dot matrix P4 white std.; P31 green opt.	12 Opt. 128 ASCII 7 x 11 dot matrix P4 white std.; P31 green opt.	9 No 128 ASCII 7 x 11 dot matrix P4 white
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size	No Std. Std. No No Std. No	No Std. Std. No No Std. No	No Std. Std. No No Std. No	No Std. Std. No No Std. No	No Std. Std. No No Std. No
Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	Up/down std. 2 std. No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	Up/down std. 2 std. No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	Up/down std. 4 std.; up to 9 opt. No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	Up/down/back std. Up to 5 No Both std. Std. Std. 4 std. Fwd./back std. Std. Std. Char./line/screen std.	Up/down std. 2 std. No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys	Typewriter 128 ASCII Std. 8 std. (screen labelled) Std.	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter 128 ASCII Std. 8 std. (screen labelled) Std.	Typewriter 128 ASCII Std. 8 std. (screen labelled) Std.	Typewriter 128 ASCII Std. 8 std. (screen labelled) No
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Opt. (integral) No No No —	— Thermal No Std. 7221 C/T 8-pen plotter, 7225 1-pen plotter	Impact, 32/180 cps No No Std. —	Impact, 32/180 cps No No Std. —	No No No No —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Full-duplex Asynchronous ASCII ASCII 110-9600 Char./line/block No RS-232-C	Full-duplex Asynchronous ASCII ASCII 110-9600 Char./line/block No RS-232-C	Half/full-duplex Async./sync. ASCII ASCII 110-9600 Char./line/block Std. RS-232-C	Half/full-duplex Async./sync. ASCII ASCII 110-9600 Char./line/block Std. RS-232-C	Full-duplex Asynchronous ASCII ASCII 110-9600 Char./line/block No RS-232-C
Integral modem Integral acoustic coupler	No No	No No	No No	No No	No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	131 — 2,210 — 14 4/81 4/81 — Hewlett-Packard	222 — 3,250 — 18 8/81 8/81 — Hewlett-Packard	173 — 3,035 — 21 9/81 9/81 — Hewlett-Packard	246 — 4,400 — 26 7/80 7/80 — Hewlett-Packard	99 — 1,720 — 16 8/81 8/81 — Hewlett-Packard
COMMENTS	Optional integral thermal printer (\$1,210)	Graphics terminal; optional integral thermal printer (\$1,210)	Optional integral thermal printer (\$1,210)	Optional integral thermal printer (\$1,210); word processing version (2626W) available— \$5,000	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Hewlett-Packard 2625A	Hewlett-Packard 2645A	Hewlett-Packard 2628A	Hewlett-Packard 2627A	Honeywell VIP 7201
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 32 No IBM 3276/3278 Std. HP2623A Graphics Set, TEK 4014	Stand-alone — No No Std. —	Stand-alone 8 No No Std. HP2623A Graphics Set, TEK 4014	Stand-alone — No No Std. TEK 4010, ANSI	Stand-alone 1 No No Std. Honeywell
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920 Up to 6 pages 24 x 80	1920 4K std.; plus opt. 8K 24 x 80	1920 Up to 6 pages 24 x 80	1920 2 pages 24 x 80	1920 80/24/1 24 x 80
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 Tilt & swivel opt. 128 ASCII 7 x 11 dot matrix White (std.); amber or green (opt.) No	11 No 128 ASCII 9 x 15 dot matrix P39 white No	12 Tilt & swivel opt. 128 ASCII 7 x 11 dot matrix White (std.); amber or green (opt.) No	12 Opt. 128 ASCII 7 x 11 dot matrix Color Yes (8)	12 Tilt opt. 96 ASCII/26 special 7 x 11 dot matrix P31 green std. No
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size	No Std. Std. Std. No Inverse video std. No	No Opt. Opt. No Opt. Std. No	No Std. Std. Std. Std. Std. No	Yes (8) Std. Std. No No Std. No	No Std. Std. No No Std. No
Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	Up/down, smooth Up to 6 pages Std. Std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	Up/down std. 1-2 std.; 3-6 opt. No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	Up/down, smooth Up to 6 pages Std. Std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	Up/down 2 pages Std. Std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	Up std. No Std. Both std. — Std. No Std. Std. Std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys	Typewriter; over- lays for IBM mode 128 ASCII/96 EBCDIC Std. 16 std.	Data entry 128 ASCII Std. 8 std.	Typewriter 128 ASCII Std. 16 std.	Typewriter 128 ASCII Std. 8 std.	Typewriter 128 ASCII Std. 7 std.
Numeric keypad	Std.	Std.	Std.	Std.	Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	RS232, HP1B 120 cps opt. No Opt. HP1B printer	Various No Opt. 7 opt. slots —	RS232, HP1B 120 cps opt. No RS232 std., HP1B opt.	Printer port std. Printer port std. RGB video opt. RS232 std. Digitizing graphics tablet	— No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Full duplex Asynchronous/sync IBM mode-BSC ASCII, EBCDIC 96-19.2K Char./line/block Opt. RS232; HP dc. 422 std.	Half/full-duplex Asynchronous TTY ASCII 110-9600 Char./line/block Std. RS-232-C, 20mA	Full duplex Asynchronous/sync — ASCII 19,200 Char./line/block Opt. RS232; 20mA opt.	Full duplex Asynchronous — ASCII 110-9600 Char./line/block No RS232/422 std.	Full-duplex Asynchronous ASCII 7-bit ASCII 300-19,200 Char./line/block No RS-232-C/RS-422A
Integral modem Integral acoustic coupler	No No	No No	No No	No No	No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Contact vendor — 3,495 Included in above — 10/83 — Hewlett-Packard	— 4,600 — 22-30 9/76 9/76 Over 120,000 (264X) Hewlett-Packard	Contact vendor — 3,195 — 10/83 — Hewlett-Packard	Contact vendor — 5,975 — — — Hewlett-Packard	— 795 — 20 12/82 2/83 Honeywell
COMMENTS	Dual System Display offers HP and IBM compatibility; optional graphics, word processing, printer; multiple modes		Operates as a dedicated word processor with HP3000 HPword software	High-quality color raster display, graphics standard	Honeywell CAMP maint. available at \$80 year

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Honeywell VIP 7301/ 7303/7307	Honeywell VIP 7801/ 7802/7804/ 7805	Honeywell VIP 7814	Honeywell VIP 7700R/ 7705R	Honeywell VTS 7710
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. Honeywell	Stand-alone 1 No No Std. Honeywell	Stand-alone 1 No No No Honeywell	Stand-alone 1 No No No Honeywell	Cluster 4 No No No Honeywell VIP
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	2000 80/25/1 25 x 80	2000 1 page std., 3 opt. 25 x 80	2000 6K/72/3 24 x 80	1920 80/24/1 24 x 80	1920 — 24 x 80
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 No 120 7 x 9 dot matrix P31 green std.	12/15 Std. (7802/7805) 139 ASCII/special 7 x 10 dot matrix P4 white/P31 green	12 Tilt opt. 106 ASCII/special 7 x 9 dot matrix P31 green std.	12 No 64/96 ASCII 5 x 7 dot matrix P4 white	12 Tilt std. 96 ASCII 8 x 12 dot matrix P39 green
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size	No Std. Std. Std. No Std. No	No Std. Std. Std. No Std. No	No Std. Std. Std. Std. Std. No	No No Std. Std. No No No	No No Std. Std. No No No
Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	No Up/horiz. std.(7303) No Std. Both std. No Std. No Std. Std. Std. Line/screen std.	Up std.; down opt. 1 std., 3 opt. Std. Both std. Std. Std. 2 std. Std. Std. Std. Page/field std.	Up/down std. 3 pages std. Std. Both std. Std. Std. 2 std. Fwd./back std. Std. Std. Std.	No No Std. Addressable only Std. Std. No Std. Std. Std. Char./line std.	No No No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys	Typewriter, data entry, WP 128 ASCII Std. 12 std.	Typewriter 128 ASCII Std. 12 std.	Typewriter 128 ASCII Std. 12 std.	Typewriter 96 ASCII Std. Std.	Typewriter 96 ASCII Std. See comments
Numeric keypad	Std. (7303/7307)	Std.	Std.	Std.	Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No No —	100/120 cps impact 280 lpm Opt. Std. —	100 cps impact Var. dot matrix No No 10 terminal cluster unit	120 cps impact No No Opt. —	100/160 cps impact 220 lpm belt Std. No —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half/full-duplex Asynchronous ASCII 7-bit ASCII 300-19,200 Character No RS-232-C, RS-422A 20mA, MIL-188C	Half/full-duplex Async.; Sync (04,05) Honeywell VIP ASCII 110-19,200 Char./line/block Std. (7804, 7805) RS-232-C, 20/60 mA	Half/full duplex Synchronous Honeywell VIP ASCII 2400-9600 Block Std. RS-232-C	Half/full-duplex Synchronous Honeywell ASCII 2400/4800/9600 Block Poll/select RS-232-C, MIL-188C	Half-duplex Synchronous Honeywell VIP ASCII Up to 9600 Block Std. RS-232-C
Integral modem Integral acoustic coupler	No No	No No	No No	No No	No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 1,900 — 20 4/81 7/81 — Honeywell	— — 3,175-3,705 — 32-39 10/78 — Honeywell	— — 2,700 — 25 11/82 1/83 — Honeywell	— — 3,990 — 36 3/77 — Honeywell	57 (3 yr.) 215 (3 yr.) 1,250 4,535 63 4/81 4/81 — Honeywell
COMMENTS	Customer-assisted maintenance priced at \$40/yr.; separate/interchangeable keyboards for standard conversational, word processing or data entry applications	Horizontal & vertical line graphics forms creation; buffered printer adapter opt.; up to 32 units sync. can be multi-dropped on a single line	Honeywell CAMP maint. available at \$115 year horizontal & vertical line drawing symbols standard—100 line buffer print adapter or standard—1000 foot drive capability standard	Up to 32 units can be multi-dropped on a single line	Function codes obtainable via control key sequences

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Honeywell VTS 7740	Human Designed Systems Concept AVT	Human Designed Systems Concept AVT-APL	Icot 700	Icot 701
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Cluster 8 No No No Honeywell VIP	Stand-alone — No No Std. DEC VT100	Stand-alone — No No Std. DEC VT100	Cluster 12 No 3278 BSC/SDLC No —	Cluster 12 No 3278 BSC/SDLC No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80 12 Tilt std. 96 ASCII 8 x 12 dot matrix P39 green No No Std. Std. No No No No No No No No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920, 3168 4 pages std.; 8 opt. 24 x 80, 24 x 132 12 Tilt std. 128 ASCII 7 x 9/5 x 7 (132) Amber std.; P31 green, P4 white opt. No Std. Std. Std. Std. No No Up/down std. 4 std.; 8 opt. Std. Both std. Std. Std. 4 std. Fwd./back std. Std. Std. Char./line/screen std.	1920, 3168 4 pages std.; 8 opt. 24 x 80, 24 x 132 12 Tilt std. 128 ASCII/APL 7 x 9/5 x 7 (132) Amber std.; P31 green, P4 white opt. No Std. Std. Std. No No Up/down std. 4 std.; 8 opt. Std. Both std. Std. Std. 4 std. Fwd./back std. Std. Std. Char./line/screen std.	2000, 3696 — 25 x 80, 28 x 132 12 No 87 ASCII Multl. P31 green No Std. Std. Std. Std. No No No No Std. Addressable only Std. Std. Std. No Std. Std. Std. Std.	560-3696 — 14 x 40, 17/31 x 64, 14/25/33/44 x 80 12 No 87 ASCII Multl. P31 green No Std. Std. Std. Std. No No No No Std. Addressable only Std. Std. Std. No Std. Std. Std. Std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 96 ASCII Std. See comments Std.	Typewriter 128 ASCII Std. 46 std. opt. Std.	Typewriter 128 ASCII, APL Std. 46 std. opt. Std.	Typewriter — Std. Std. Std. Std.	Typewriter — Std. Std. Std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	100/160 cps impact 220 lpm belt Std. No —	No No Opt. 1 std., 2 opt. Shared printer interface	No No Opt. 1 std., 2 opt. Shared printer interface	No — Std. Opt. —	Std. — Std. Opt. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half-duplex Synchronous Honeywell VIP ASCII Up to 9600 Block Std. RS-232-C No No	Half/full-duplex Asynchronous — ASCII 50-9600 Char./block No RS-232-C std.; 20mA opt.	Half/full-duplex Asynchronous — ASCII 50-9600 Char./block No RS-232-C std.; 20mA opt.	Full-duplex Asynchronous Async./BSC, SNA SDLC ASCII 9600 Character Yes RS-232-C/RS-422 No No	Full-duplex Asynchronous Async./BSC, SNA SDLC ASCII 9600 Character Yes RS-232-C/RS-422 No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	57 (3 yr.) 525 (3 yr.) 1,250 12,200 96 4/81 4/81 — Honeywell	96-148.50 — 1,295-1,445 — — — — HDS, distributors	75-83 — 1,495-1,645 — — 11/82 12/82 500 HDS, distributors	— — 1,095 5,800-8,500 — 1982 1982 — Icot	— — 1,750 5,800-8,300 — 1982 1982 — Icot
COMMENTS	Function codes obtainable via con- trol key sequences	Non-volatile memory; networking between mult. comm. lines; self- test capability; multiple status lines (25th line); light-weight	Non-volatile memory; networking between mult. comm. lines; self- test capability; multiple status lines (25th line); light-weight	Built-in keypad calculator, alter- nate application sessions	Built-in keypad calculator, alter- nate application sessions

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Informer 201/203/205	Informer 207	Informer 304 Series	Informer 401	Informer 375/376
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either 1(VT100);32(376) No IBM 3276/3278 BSC No DEC VT100	Either 1; 32; 8 Portable IBM 3276/3278 BSC No DEC VT100	Stand-alone 1 No No Std. See comments	Stand-alone 1 No 3101 Std. —	Stand-alone 1 No 3275-BSC No No
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 4K 24 x 80 plus status line 11 Tilt std. ASCII (VT100) 8 x 10 dot matrix P31 green std. No Std. Std. Std. Std. Std. Std. (VT100 only) Up/down std. (VT100) No Std. Std. Std. Std. Std. Std. Std. Std. Std. No —	1920 4K 24 x 80 plus status line 11 Tilt std. ASCII; full IBM set 8 x 10 dot matrix P31 green std. No Std. Std. Std. Std. Std. Std. (VT100 only) Up/down std. (VT100) — Std. Std. Std. Std. Std. Std. Std. Std. Std. No —	2048 32/16/4; 40/12/4 12 x 40; 24 x 80, 16 x 32, 16 x 64 9 Std. 128 ASCII 7 x 9 dot matrix P4 white std.; P31 green opt. No Opt. Std. Std. Std. Std. No Up/down std. No Std. Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 80/24/1 24 x 80 9 Std. 128 ASCII 7 x 9 dot matrix P4 white std.; P31 green opt. No Std. Up/down std. No Std. Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 80/24/1 24 x 80 plus status line 9 std., 12 opt. Tilt and swivel std. 96 7 x 9 dot matrix P31 green std., P4 white opt. No Std. Std. Std. Std. No No No Std. Both std. Std. Std. No Fwd./back std. Std. No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Typewriter 201; Data entry (203/205) ASCII(VT100); EBCDIC Std. on 203, 205 18 (VT100); 24 Std. on some models 120 cps — No Std. Light pen	Typewriter ASCII(VT100); EBCDIC Std. 18 (VT100); 24 Std. 120 cps — No Std. Light pen	Data entry 128 ASCII Opt. 14 std.; 2 levels each Std. No No Std. Opt. Light pen, bar code wand	Data entry 128 ASCII No 8 std. No No Std. Opt. —	Data entry 96 EBCDIC Opt. 24 std. Std. 30 cps dot mat. opt. No Std. Opt. Light pen
TRANSMISSION PARAMETERS Mode Technique Communications, protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Full-duplex Async./sync. ANSI (VT100); BSC ASCII; EBCDIC 38.4K (VT100); 19.2K Char. (VT100); block Std.(376 & 378 only) RS-232-C; COAX (378 only) Opt. No	Full-duplex Async.; Sync. ANSI; BSC ASCII; EBCDIC 38.4K (VT100); 19.2K Char. (VT100); block Std.(376 & 378 only) RS-232-C; COAX (378 only) Opt. No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block Both std. RS-232-C, 20mA No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character Opt. RS-232-C, 20mA No No	Half/full-duplex Synchronous BSC EBCDIC 50-9600 Block Std. RS-232-C Opt. No
COMMENTS	Models available with Informer VT100, 376, or 378 software packages	Available with Informer VT100, 376, or 378 software packages	Emulations include: ADDS Regent 100, DEC VT52, NCR 796-101/301, Data- point 3601, Data General 6053/D200		Models I, D, and S, and 201-205, including execu- tive inquiry with hide-away keyboard

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Informer 377/378	Intecolor E 8001 G/H/R	Intecolor 2405	Intecolor 2427	Interaction Systems TT-150/TT-151
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Cluster 8 No BSC & SDLC/SNA No No	Stand-alone 1 No 3275 opt. Std. No	Stand-alone 1 No No Std. DEC VT100, ANSI 3.64	Stand-alone 1 No No Std. Tektronix 4010 & 4027	Stand-alone — No No No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 80/24/1 24 x 80 plus status line 9 std., 12 opt. Tilt and swivel std. 96 7 x 9 dot matrix P31 green std., P4 white opt. No Std. Std. Std. Std. Std. No No Std. No Both std. Std. Std. No Fwd./back std. Std. No Char./line/screen std.	3840 80/48/2 48 x 80 19 No 64 ASCII/64 ISA 5x7 (G); 6x8 (H&R) 8 colors 8 colors No Std. Std. No Std. Std. No Up std. 2 opt. No Both std. Opt. No No Fwd. std. Std. Std. Char. std.	1920 80/24/2 24 x 80 13 No 64 ASCII/64 ISA 5 x 7 dot matrix 8 colors 8 colors Std. Std. No Up/down std. 2 std. No Both std. No No Std. Fwd./back std. Std. Std. Char./line/page std.	1920 80/24/2 80 x 24 13 No 64 ASCII 5 x 7 dot matrix 8 of 64 colors 8 of 64 colors Std. Std. Std. Std. No Up/down std. 2 pages std. No Both std. No No Std. Hori./ver./f./b.std. Std. Std. Char./line/page std.	1920 80/24/2 24 x 80 plus status line 15 Std. 128ASCII;graph. opt. 10 x 14 dot matrix P31 green std. No Opt. Opt. Opt. Opt. Std. No Up/down, smooth std. 2 std.; up to 8 opt. Std. Addressable only Opt. No No Fwd. std. No No No
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Data entry 96 EBCDIC Opt. 24 std. Std.	Typewriter 64 ASCII Std. 16 std. Std.	Typewriter 64 ASCII No 12 std.; 12 opt. Std.	Typewriter 64 ASCII Yes 12 or 24 opt. Std.	Typewriter (151) 64 ASCII (151) Std. (151) 20 std. (151) Std. (151)
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	30 cps dot mat. opt. No Std. Opt. Light pen	55 cps impact opt. No No RS-232-C Light pen (H&R), digitizer (R), plotter (R) all optional	55 cps impact opt. No No RS-232-C; 20mA opt. Light pen opt.	55 cps impact opt. No No RS-232-C; 20mA opt. Light pen opt.	No No No Std. Touch-sensitive screen
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Synchronous BSC EBCDIC 50-9600 Block Std. RS-232-C Opt. No	Half/full-duplex Async.; sync. opt. ASCII ASCII Up to 9600 Character No RS-232-C, 20mA opt. No	Half/full-duplex Asynchronous ANSI X3.64 ASCII, ANSI Up to 19,200 Character No RS-232-C, 20mA No No	Half/full-duplex Asynchronous ANSI X3.64 ASCII, ANSI Up to 19,200 Character No RS-232-C, 20mA opt. No No	Half/full duplex Asynchronous ASCII ASCII Up to 19,200 Character No RS-232-C, 20mA opt. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Purchase only — 1,700-2,050 5,000-5,400 — — — — Informer	Purchase only — 2,745/3,175/3,975 — 1975/1979/1982 — Intecolor rep., service centers	Purchase only — 1,295 — 7/82 10/82 — Intecolor rep., service centers	Purchase only — 2,695 — 6/83 11/83 — Intecolor, service centers	— — 2,470; 2,860 — — 11/82 1/83 — Interaction Systems
COMMENTS	Models I, D, and S, and 201-205, including execu- tive inquiry with hide-away keyboard; all models used with 374 controller	Resolution—160 H x 192 V; 480 H x 384 V (H&R); low resolution character cell graphics mode	Non-glare CRT coating		Touch-sensitive display terminal; can be operated in a public environment since all user con- trols are accessed thru keyed door; keyboard std. on TT-151

Alphanumeric Display Terminals

SUPPLIER AND MODEL	IBM 3276/ 3278/3279	IBM 3178	IBM 3274/3278	IBM 3290	IBM 3101
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Cluster 8 No 3270 System No —	Cluster 32 No 3270 System No IBM 3278 Model 2	Cluster 32 No 3270 System No —	Cluster 32 No 3270 System No —	Stand-alone 1 No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	See comments — 12/24/32/43 x 80, 27 x 132 (3278) 14 No 96; 120 APL opt. 7 x 9/14; 7 x 11 White 3279 only Std. Std. Std. Std. Std. No No No No No Addressable only Std. Std. Std. Std. No Char./line/screen std.	1920 24 x 80 12 Std. 94 7 x 14 dot matrix Green No Std. Std. Std. Std. Std. No No No Std. Addressable only Std. Std. Std. Std. No Char./line/screen std.	See comments — 12/24/32/43 x 80, 27 x 132 14 No 64; 96; 120 APL 7 x 9/14; 7 x 11 White No Std. Std. Std. Std. Std. No No No Std. Addressable only Std. Std. Std. Std. No Char./line/screen std.	5300, 9920 — 50 x 106, 62 x 160 10.7 x 13.4 Tilt std. 64; 96; 120 APL 5x8/7x9 dot matrix Amber gas plasma No Std. Std. Std. Std. Std. No Std. Std. Addressable only Std. Std. Up to 16 partitions Std. Std. No Char./line/screen std.	1920 — 24 x 80 plus status line 12 Std. 128 7 x 14 dot matrix Green No — — — — Std. No — No Std. Std. Std. (Mdl 20,22,23) Std. (Mdl 20,22,23) Std. (Mdl 20,22,23)
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Several ASCII/EBCDIC Std. Opt. Std.	Typewriter, data entry ASCII/EBCDIC Std. 10/12 std. Std.	Several ASCII/EBCDIC Std. Std. Std.	Typewriter, APL ASCII/EBCDIC Std. 24 std. Std.	Typewriter ASCII Std. 8 Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Std. No No Std. Audible alarm, mag. slot reader, light pen, keylock	Std. No No Std. Audible alarm, security keylock	Std. No No Std. Audible alarm, mag. slot reader, light pen, keylock, I.D. reader	Std. No No Std. Audible alarm, security keylock	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full duplex Synchronous BSC/SDLC ASCII/EBCDIC 1200-9600 Block only Std. RS-232-C No No	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC 1200-9600 Block only Std. RS-232-C No No	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC 1200-9600 Block only Std. RS-232-C No No	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC 1200-9600 Block only Std. RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII Up to 9600 Char./block No RS-232-C, 20mA RS-422 No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	75-197 219-238 2,060-6,105 5,380-5,830 10.00-27.50 1977 1977 — IBM	Purchase only — 1,660-1,720 — 75-252/yr. 3/83 — IBM	75-111 211-765 2,060-3,070 6,035-18,500 10-14 1977 1978 — IBM	315 (rental) — 7,100 — 30 3/83 — IBM	Purchase only — 1,405-4,650 — 70-80/yr. 1979 1979 — IBM
COMMENTS	Display capacities available include: 960, 1920, 2560, 3440 & 3564 (3278 only)		Display capacities available include: 960, 1920, 2560, 3440 & 3564; con- troller (3274) ac- commodates 3278 & 3277 display stations		Six models; 10, 12, 13 (conversational); 20, 22, 23 (block mode/editing)

Alphanumeric Display Terminals

SUPPLIER AND MODEL	IBM 3104	IBM 5251	IBM 5291/5292	IBM 8775	Intertec Intertube III
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either — No 8775, 3276, 3278 No —	Either Up to 9 No SDLC No —	Either Up to 9 No 5251-11 No —	Either — No Std. No —	Stand-alone 1 No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80 plus status line 12 Std. 94 7 x 14 dot matrix White No Std. Std. Std. Std. No Std. No Std. No Std. Both std. Std. Std. Std. Std. Std. Std. Std. Char./field/screen std.	960, 1920 — 12/24 x 80 12; 15 opt. No 96; 188 opt. 8 x 16 dot matrix White No — Std. No Std. Both std. Std. Std. — Std. Std. No Char./field/screen std.	1920 — 24 x 80 plus status line 12 Tilt std. 96 7 x 11 dot matrix White 7 colors (5292) Std. Std. Std. Std. No Std. Std. Both std. Std. Std. Std. Std. Std. No Char./field/screen std.	960-3440 — 12/24/32/43 x 80 12 Tilt std. 96 9 x 12/9 x 16 White No Std. No Std. No Std. Both std. Std. Std. Std. Std. Std. Std. Std. Char./field/screen std.	2000 — 25 x 80 12 No 128 ASCII 8 x 10 dot matrix White No No Std. No Std. Std. Std. Std. Std. Std. No Std. Std. Std. Std. Std. RS-232-C
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, data entry EBCDIC Std. 10 (Model B1); 24 (Model B2) Std.	Typewriter EBCDIC Std. 24 std. Std.	Typewriter EBCDIC Std. 24 command functions Std.	Typewriter, data entry EBCDIC/APL Std. Std. (various) Std.	Typewriter ASCII No 14 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Std. Std. No Std. Audible alarm, key- lock, clock	Std. No No Std. Mag. stripe reader, selector light pen, aud. alarm, keylock	Std. No No Std. Mag. stripe reader, selector light pen, keylock	Std. Std. No Std. Audible alarm, key- lock, clock	No No No Std. RS-232-C
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Synchronous BSC/SDLC EBCDIC Up to 38,400 Block Std. RS-232-C No No	Half/full duplex Synchronous BSC/SDLC EBCDIC 1200-9600 Block only Std. RS-232-C, twinax cable Opt. No	Half/full duplex Synchronous BSC/SDLC EBCDIC 1200-9600 Block Std. RS-232-C Opt. No	Half/full-duplex Synchronous BSC/SDLC EBCDIC Up to 38,400 Block Std. RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII 110-9600 Char./line/block Opt. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	Purchase only — 2,190-2,250 — 95-100/yr. 3/82 — IBM	115-183 — 2,135-3,040 — 18.50-40.00 — 1978 IBM	Purchase only — 2,100/4,950 — 230/yr./420/yr. 7/82 — IBM	93-111 — 3,240-3,655 — 22.00-27.50 10/78 8/79 IBM	— — 895 — 108/yr. — 8/78 Intertec & third party
COMMENTS	Model B1 equipped with 75-key data entry keyboard, Model B2 equipped with 87-key type- writer keyboard	Workstations for IBM S/34, S/38, & Series 1; 5251-1/ 11 is remote cluster or local station; 5251-2/12 is remote cluster controller/ station	5291 is a mono- chrome terminal; 5292 is a color version	Workstation for IBM 8100 Information System; also at- taches to 4331 processor, 4300 & S/370	Z-80 processor based, single board design; uses speci- fically designed non-glare high resolution CRT; also features local editing capability

Alphanumeric Display Terminals

SUPPLIER AND MODEL	C. Itoh Electronics CIE-7800	ITT Courier 270	ITT Courier 275	ITT Courier 277	ITT Courier 278
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either — No 3178, 3278 Opt. DEC VT100, Burroughs	Cluster 32 No 3270, full line No —	Stand-alone 1 No 3275 No —	Cluster 32 No 3277 No —	Cluster 32 No 3278 No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	3564 1 pg. Selectable 14 Tilt std. 96 ASCII, EBCDIC 7 x 9 dot matrix P31 green, amber No Std. Std. Std. Std. Std. Up/down, smooth std. No Std. Addressable std. Std. Std. No Std. Std. Std. Char./line/screen std.	1920-3564 1920-3564 char. 24/32/43 x 80; 27 x 132 14 No 64 std. 9x12,9x11,9x9,5x7 Green No Std./opt. Opt. No No No No No No Std. Both std. Std. Std. No Std. Std. No Char./line/screen std.	480, 1920 480, 1920 char. 12 x 40; 12/24 x 80 15 No 64 std., 96 opt. 7 x 10 dot matrix Green No Std./opt. Opt. No No No No No No Std. Both std. Std. Std. No Std. Std. No Char./line/screen std.	480, 1920 480, 1920 char. 12 x 40; 24 x 80 15 No 64 std., 96 opt. 7 x 10 dot matrix Green No Std./opt. Opt. No No No No No No Std. Both std. Std. Std. No Std. Std. No Char./line/screen std.	1920-3564 1920-3564 char. 24/32/43 x 80, 27 x 132 14 No 96 std. 9 x 12, 9 x 11, 9x9 Green No Std./opt. Opt. No No No No No No Std. Both std. Std. Std. No Std. Std. No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 96 ASCII, 128 EBCDIC Std. 24 std. Std.	Typewriter, data entry, APL 64 ASCII/96 EBCDIC Std. 24 std. Opt.	Typewriter, data entry 64 ASCII/96 EBCDIC Std. 12 std. Opt.	Typewriter, data entry 64 ASCII/96 EBCDIC Std. 12 std. Opt.	Typewriter, data entry 96 EBCDIC Std. 24 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. No	Impact, 150-240 cps Belt, 600 lpm No Std. Light pen, slot reader, extended device adapter	Impact, 60-180 cps Belt, 340 lpm No Std. —	Impact, 60-180 cps Belt, 340 lpm No Std. Badge reader, light pen	Impact, 150-240 cps Belt, 600 lpm No Std. Light pen, slot reader
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Async./sync. Bisynch SDLC ASCII, EBCDIC 110-19.2K Character Std. RS-232-C, COAX No No	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC Up to 19,200 Block Std. RS-232-C No No	Half-duplex Synchronous BSC ASCII/EBCDIC Up to 9600 Block Std. RS-232-C No No	See comments See comments See comments See comments See comments See comments Std. RS-232-C No No	See comments See comments See comments See comments See comments See comments Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Contact distributor — 1,550-2,345 — — 5/83 11/83 — Selling party	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor — 1974 — ITT Courier	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor — 1974 — ITT Courier	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor — 1977 — ITT Courier	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor — 1980 — ITT Courier
COMMENTS	May be ordered with alternate person- ality, dual net- working available	Fully compatible with IBM 3270 Information Display System including 3271/2/4/6/7/8/9		Interfaces to IBM 3271, 3272, and 3790 controllers (or System/3) in same manner as on IBM 3277	Interfaces to IBM 3274, 3276, or 4300 CPUs in same manner as on IBM 3278

Alphanumeric Display Terminals

SUPPLIER AND MODEL	ITT Courier 279	ITT Courier 1700	iXO Telecomputing System TC102	iXO Telecomputing System TC200	Kimtron ABM 83
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Cluster 32 No 3279-2A No —	Cluster 32 No 3178 No —	Stand-alone — Std. No Std. —	Stand-alone — Std. No Std. —	Stand-alone — No Opt. Std. TVI 925/920/910
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1920 char. 24 x 80 14 No 96 9 x 12 dot matrix Green 7 colors std. Std./opt. Opt. No No No No No No No No Std. Std. Addressable only Std. Std. No Fwd./back std. Std. Std. Char./line/screen/ var. fields std.	1920 1920 char. 24 x 80 12 Yes 96 std. 7 x 8 dot matrix Green No Std./opt. Std./opt. No No No No No No No No Std. Both std. Std. Std. No Fwd./back std. Std. No Char./line/screen std.	16 180 characters 1 x 16 1 line (LCD) No 64 ASCII 5 x 7 dot matrix LCD No No No No No 2-30 cps No No No No No Std. No No No Char./line std.	16 1300 characters 1 x 16 1 line (LCD) No 64 ASCII 5 x 7 dot matrix LCD No No No No No 2-30 cps No No No No Std. Std. No No Std. Char./line std.	2000 2 page opt. 25 x 80 12 Tilt std. 128 ASCII 7 x 9 dot matrix P31 std., amber opt. No Std. Std. Std. Std. No Std. 2 pages opt. Std. Std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, data entry 96 ASCII; 128 opt. Std. 24 std. Std.	Typewriter, data entry 64 ASCII, 96 EBCDIC Std. 24 std. Opt.	Typewriter 128 ASCII No No	Typewriter 128 ASCII No No	Typewriter 96 ASCII Std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Impact, 150-240 cps Belt, 600 lpm No Std. Light pen, slot reader	150-240 cps 600 lpm No No No	40 cps opt. No Opt. No —	40 cps opt. No Opt. No —	180 cps 300 lpm No Std. No
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC Up to 19,200 Block Std. RS-232-C No No	Half-duplex Synchronous BSC/SDLC ASCII 19,200 Block Std. RS-232-C No No	Half/full-duplex Asynchronous — ASCII 300 Character No Phoneline Std. Opt.	Half/full-duplex Asynchronous RPCP ASCII 300 Character/block No Phoneline Std. Opt.	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C, 20mA Opt. No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 1981 ITT Courier	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 1983 ITT Courier	— — 325 — — 10/82 — iXO, Inc.	— — 395 — — 5/83 — iXO, Inc.	— — 695 — — 7/83 8/83 450 RCA Service Co.
COMMENTS	Red, blue, green, white, pink, yellow, & turquoise are standard colors	IBM 3278 compatible	Hand-held system for one-button access to public and private databases		

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Kimtron ABM 85H	Kimtron ABM 85H/ D100/200	Kimtron ABM 85H/VT-132	Kimtron ABM 86	Kimtron KGT-100
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No Opt. Std. —	Stand-alone — No Opt. Std. Data General D100/ 200	Stand-alone — No Opt. Std. DEC VT100/132	Stand-alone — No Opt. Std. TeleVideo 912, 920, 925 std.; LSI, ADDS	Stand-alone — No No Std. DEC VT100, Tektronix 4010/4012
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	2000 4 page opt. 25 x 80	2000 4 page opt. 25 x 80	2000 4 page opt. 25 x 80	2160 4 pages opt. 27 x 80	2000, 3300 4 pages 27 x 80, 25 x 132
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 Tilt std. 128 ASCII/11 graph. 7 x 9 dot matrix P31 green std., P4 white & amber opt.	12 Tilt std. 258 7 x 9 dot matrix P31 std., amber opt.	12 Tilt std. 258 7 x 9 dot matrix P31 std., amber opt.	12 Tilt std. 128 ASCII/15 graph. 7 x 9 dot matrix P31 green std., P4 white or amber opt.	12 No 256 plus graphics 7 x 9 dot matrix Green, gray, amber
Color capability Programmable field/char. highlighting via:	No Std. Std. Std. Std. Std. Std. No Std. 4 opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	No Std. Std. Std. Std. Std. Std. No Std. 4 pages opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen	No Std. Std. Std. Std. Std. Std. No Std. 4 pages opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen	No Std. Std. Std. Std. Std. No Up/down/smooth std. 2 opt. Std. Std. Std. Std. Std. Fwd./back std. Std. Std. Std.	No Std. Std. Std. Std. Std. Std. Std. Std. Std. 4 std. Std. Std. Std. Std. Std. Fwd./back std. Std. Std. Std.
KEYBOARD PARAMETERS Style	Typewriter	Typewriter	Typewriter	Typewriter	Typewriter
Character/code set Detachability Program function keys	96 ASCII Std. 16 std.	96 ASCII Std. Std.	96 ASCII Std. Std.	96 ASCII Std. 16 std.	96 ASCII Std. 16 std.
Numeric keypad	Std.	Std.	Std.	Std.	Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	19.2K No No Std. —	180 cps 300 lpm No Std. No	180 cps 300 lpm No Std. No	No No No Std. —	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./block/line No RS-232-C, 20mA opt. Opt. No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C, 20mA	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C, 20mA	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./block/line No RS-232-C; 20mA opt. Opt. No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./block/line No RS-232-C; 20mA opt. Opt. No
PRICING AND AVAILABILITY Integral modem Integral acoustic coupler	— No	— No	— No	— No	— No
Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 795 — — 5/81 9/81 13,900 RCA Service Co.	— — 895 — — 8/83 8/83 150 RCA Service Co.	— — 895 — — 9/83 9/83 30 RCA Service Co.	— — 995 — — 5/82 12/82 1200 RCA Service Co.	— — 1,800 — — 11/82 1/83 500 RCA Service Co.
COMMENTS					

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Lear Siegler ADM 3A	Lear Siegler ADM 5	Lear Siegler ADM 11	Lear Siegler ADM 22	Lear Siegler ADM 23
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. ADM 3	Stand-alone — No No Std. ADM 3A	Stand-alone — No No Std. —	Stand-alone — No No Std. ADDS Regent 25, Hazeltine 1500	Stand-alone — No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920 1 page 24 x 80	1920 1 page 24 x 80	1920 — 24 x 80 plus status line	1920 1 page 24 x 80	1920 80/24/2, 80/51/1 24 x 80
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 No 64 ASCII; 96 opt. 5 x 7 dot matrix P4 white, P31 green	12 No 128 ASCII 5 x 9 dot matrix P4 white, P31 green	12 Std. 128 ASCII 7 x 10 dot matrix P31 green; amber opt. No	12 No 128 ASCII 7 x 11 dot matrix P31 green	12 No 128 ASCII, graph. 7 x 8 dot matrix P4 white, P31 green No
Color capability Programmable field/char. highlighting via:	No	No	No	No	No
Underline	No	No	No	Std.	Std.
Blink	No	No	Std.	Std.	Std.
Blank	No	No	Std.	No	Std.
Bold	No	No	Reduced std.	No	No
Reverse	No	Std.	Std.	Std.	Std.
Double size	No	No	No	No	No
Scroll	Up std.	Up std.	Std.	Std.	Up std.
Paging	No	No	No	No	2 std.
Selectable cursor blinking	No	No	Std.	Std.	Std.
Addressable/readable cursor	Addressable only	Addressable only	Both std.	Both std.	Both std.
Protected format	No	No	No	Std.	Std.
Partial screen transmit	No	No	No	Std.	Std.
Split screen/windows	No	No	No	No	Window
Tabulation	No	No	No	Std.	No
Character insert/delete	No	No	No	Std.	Std.
Line insert/delete	No	No	No	Std.	Std.
Erase	No	Line/screen std.	Line/page/screen std.	Line/page std.	Line/screen std.
KEYBOARD PARAMETERS Style	Teletype	Teletype	Typewriter	Typewriter	Typewriter
Character/code set	128 ASCII	128 ASCII	128 ASCII	128 ASCII	128 ASCII
Detachability	No	No	Std.	Std.	No
Program function keys	No	No	4 std.	7 std.	8 opt.
Numeric keypad	Opt.	Std.	Std.	Std.	Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Dot matrix, 180 cps No No Std. Graphics, voice recognition	Dot matrix, 180 cps No No Std. Graphics, voice recognition	Dot matrix, 180 cps No No Std. —	Dot matrix, 180 cps No No Std. —	Dot matrix, 180 cps No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half/full-duplex Asynchronous — ASCII 75-19,200 Character No RS-232-C, 20mA	Half/full-duplex Asynchronous — ASCII 75-19,200 Character No RS-232-C, 20mA	Half/full-duplex Asynchronous — ASCII 300-19,200 Character No RS-232-C, 20mA opt. No	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./block No RS-232-C, 20mA	Half/full-duplex Asynchronous — ASCII 110-19,200 Char./line/block No RS-232-C std.; 20mA opt. No
Integral modem	No	No	No	No	No
Integral acoustic coupler	No	No	No	No	No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 595 — 17 5/75 8/75 245, 100 Lear Siegler	— — 645 — 17 6/80 12/80 23,585 Lear Siegler	— — 695 — — 5/83 6/83 5000 Lear Siegler	— — 695 — — 6/82 9/82 11,000 Lear Siegler	— — 795 — 19 10/82 12/82 3,000 Lear Siegler
COMMENTS					

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Lear Siegler ADM 24	Lear Siegler ADM 24E	Lear Siegler ADM 31	Lear Siegler ADM 32	Lear Siegler ADM 36
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. —	Stand-alone — No No Std. LSI ADM 24	Stand-alone — No No Std. —	Stand-alone — No No Std. —	Stand-alone — No No Std. DEC VT100/VT52/ VT131 opt.
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 48 std., 96 opt. 24 x 80 plus 25th status line 12; 14 opt. Tilt opt. 128 ASCII, graph. 7 x 11 dot matrix P4 white, P31 green No Std. Std. Std. No Std. Double wide Up/smooth std. 1 or 2 std. Std. Both std. Std. Std. 2 std. Fwd./back std. Std. Std. Line/screen std.	1920 48lines std.;96 opt. 24 x 80 plus status line 12 Std. 128 ASCII 7 x 11 dot matrix P31 green; amber opt. No Std. Std. Std. Reduced std. Std. Double wide std. Up/smooth std. 1 std.; 2 opt. Std. Both std. Std. Std. 2 std. Fwd./back std. Std. Std. Line/screen std.	1920 2 pages 24 x 80 12 No 128 ASCII, graph. 7 x 11 dot matrix P4 white, P31 green No Std. Std. Std. Std. No Up std. 2 std. Std. Both std. Std. Std. No Fwd./back std. Std. Std. Line/screen std.	1920 2 pages 24 x 80 plus 25th status line 12 std.; 15 opt. Tilt opt. 128 ASCII, graph. 7 x 11 dot matrix P4 white, P31 green No Std. Std. Std. Std. No Up/smooth std. 2 std. Std. Both std. Std. Std. No Fwd./back std. Std. Std. Line/screen std.	1920, 3168 1 page 24 x 80, 24 x 132 12 std.; 15 opt. Tilt opt. 96 ASCII, graph. 7 x 9 dot matrix P4 white, P31 green No Std. Std. Std. No Up/smooth std. No Std. Both std. Std. Std. 2 std. Fwd. std. Std. Std. Std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 8 prog. std. Std.	Typewriter, Teletype 128 ASCII Std. 16 std. Std.	Teletype 128 ASCII No 2 std. Std.	Teletype 128 ASCII Std. 10 prog. plus 2 key std. Std.	Typewriter 128 ASCII Std. 4 std. plus alt. mode Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Dot matrix, 180 cps No No Std. Integral modem, touch screen	Dot matrix, 180 cps No No Std. —	Dot matrix, 180 cps No No Std. Graphics board	Dot matrix, 180 cps No No Std. Integral modem, touch screen, graphics board	Dot matrix, 180 cps No Opt. Std. Integral modem, graphics board
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./line/block Opt. RS-232-C std.; 20mA, RS-422 opt. Opt. No	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./line/block No RS-232-C, 20mA opt. No	Half/full-duplex Asynchronous — ASCII 110-9600 Char./line/block Std. RS-232-C, 20mA No No	Half/full-duplex Asynchronous — ASCII 110-19,200 Char./line/block Opt. RS-232-C, 20mA Opt. No	Full-dup.(half opt.) Asynchronous — ASCII 50-19,200 Char. (blk. opt.) No RS-232-C; RS-422, 20mA opt. Opt. No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 1,995 — — 6/82 — 700 Lear Siegler	— — 1,250 — — 5/83 9/83 1000 Lear Siegler	— — 1,095 — 26 6/78 8/78 35,175 Lear Siegler	— — 1,295 — 27.50 10/80 5/81 5250 Lear Siegler	— — 1,195 — — 8/81 10/81 7350 Lear Siegler
COMMENTS					

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Lear Siegler ADM 42	Lee Data 310/320	Lee Data 410/420	Liberty Electronics Freedom 50	Liberty Electronics Freedom 100
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. —	Cluster 32 No 3274/3278, 3279 No —	Cluster 32 No 3274/3278, 3279 Std. DEC VT100, VT52, HP2624B	Stand-alone 1 No No Std. TVI 910, ADDS Regent 25 LSI, ADM 3A/5	Stand-alone 1 No No Std. Televideo 910, LSI ADM 3A/5, Haz 1420
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 8 pages 24 x 80 plus 25th status line 15 Tilt std. 128 ASCII, graph. 7 x 11 dot matrix P4 white, P31 green No Std. Std. Std. No Std. No Up std. 4 std.; 8 opt. Std. Both std. Std. Std. No Fwd./back std. Std. Std. Std.	1920-3564 1 page 24 x 80, 32 x 80, 43 x 80, 27 x 132 15 Std. 128 7 x 9 dot matrix Green Yes Opt. Opt. Opt. Std. Opt. No No Std. Std. Addressable only Std. Std. Application control Fwd./back std. Std. No Std.	1920-3564 4 pages 24 x 80, 32 x 80, 43 x 80, 27 x 132 15 Std. 128 7 x 9 dot matrix Green Yes Opt. Opt. Opt. Std. Opt. No No Std. Std. Addressable only Std. Std. Application control Fwd./back std. Std. No Std.	2000 2000 char. 25 x 80 12 Tilt std. 128 ASCII 7 x 9 dot matrix P31 green No Std. Std. Std. Std. No Up std. No Std. Both std. Std. No Fwd./back std. Std. Std. Line/screen std.	2000 2000 char. 25 x 80 12 Tilt std. 128 ASCII 7 x 9 dot matrix P31 green No Std. Std. Std. Std. No Up std. No Std. Both std. Std. No Fwd./back std. Std. Std. Line/page std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Teletype 128 ASCII Std. 16 std.—opt. pro. Std.	Typewriter, data entry, APL 96 EBCDIC Std. 24 std. Opt.	Typewriter, data entry, APL 96 EBCDIC/ASCII Std. 24 std. Std.	Typewriter 128 ASCII Std. 5 std. Std.	Typewriter 128 ASCII Std. 10 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Dot matrix, 180 cps No No Std. Touch screen	Matrix, 180/340 cps No No No Opt. Bar code reader, mag. stripe reader, light pen	Matrix, 180/340 cps No No No Opt. Bar code reader, mag. stripe reader, light pen	No No No Std. —	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII 110-9600 Char./line/block Opt. RS-232-C; 20mA opt. No No	Half/full-duplex Synchronous BSC/SDLC EBCDIC 2400-19,200 Block Std. RS-232-C No No	Half/full-duplex Sync./Async. BSC/SDLC EBCDIC/ASCII See comments Char./line/block Std. RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Character No RS-232-C; 20mA No No	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Char./block No RS-232-C; 20mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 2,195 — 30 6/78 8/78 15,600 Lear Siegler	— Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 8/79 9/79 Lee Data	— Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 4/82 4/82 Lee Data	— — 395 — — 11/82 — Liberty Electronics, Sorbus Product for OEM purchase only	— — 495 — — 6/82 9/82 Liberty Electronics, Sorbus Foreign character sets supported; switchable 115-230V power
COMMENTS		Model 310 is the remote version; Model 320 is local version; screen has status line	Model 410 is the remote version; Model 420 is local version; up to 16 async. ports; line speeds; sync—2400 to 19,200; async— 300-9600		

Alphanumeric Display Terminals

SUPPLIER AND MODEL	MDS Trivex Plus 70	MDS Trivex Plus 80	Megadata System 850	Memorex 2078	Memorex 2079
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either 32 No 3277/3278 No —	Cluster 32 No 3274/3278 BSC/SDL No —	Stand-alone 1 No Opt. Opt. Opt.	Cluster 8 No 3278 No —	Cluster 32 No 3279 No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	480-1920 1 page 24 x 80, 12 x 40 15 No 95 EBCDIC 7 x 9 dot matrix P4 white/green No No No Std. Std. No No No No Opt. Std. Std. Std. No Std. Std. No Field/screen std.	480-3440 1 page 12/24 x 40, 24/ 32/43 x 80 15 Opt. 95 EBCDIC/ASCII 9x14/9x16 dot matrix Green Avail. 1983 No No Std. Std. Std. No No No Std. Std. Std. No Std. No Field/screen std.	2000 16 pages 25 x 80 15 Std. 256 11 x 15 dot matrix P31 green std.; PC144 amber opt. No Std. Std. Std. Std. No Up/down std. Std. Both std. Std. Std. 2 std. Fwd./back std. Std. Std. Char./line/screen std.	960-3564 1 page 12/24/32/43 x 80; 27 x 132 15 Tilt std. 94; APL up to 222 9 x 12, 9 x 16 P39 green, PLA amber No Std. Std. Std. Std. Std. No No No Std. Std. Std. No Fwd./back std. Std. No Char./field/screen std.	1920, 2560 1920/2560 char. 24 x 80, 32 x 80 13 Tilt std. Up to 222 9 x 12 dot matrix P22 4/7 colors std. Std. Std. Std. Std. Std. No No No Std. Both std. Std. Std. No Fwd./back std. Std. No Char./field/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, data entry, console 90 EBCDIC Std. 12 opt. Opt.	Typewriter, data entry, keypunch ASCII/EBCDIC Std. 10/12 std.; 24 opt. Opt.	Typewriter 128 ASCII Std. 96 std.	Typew., data entry, APL, attr. select EBCDIC/ASCII/APL Std. 10/12/24 std.	Typew., data entry, APL, attr. select EBCDIC/ASCII/APL Std. 10/12/24 std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Impact, 180 cps Belt, 340 lpm No Opt. Audible alarm ID card reader, light pen, security lock	Impact, 180 cps Belt, 340 lpm No No Audible alarm, security lock, light pen, controller selector	30-350 cps impact No Opt. 3 std. Tape punch, audible alarm, dual diskette drive	Impact, up to 350 cps No No Std. Light pen, ext. highlighting, APL, graph., secu. key-lock, audible alarm	Up to 350 cps impact No Opt. Std. Lgt. pen, alarm, ext. highlighting, graph. APL, keyboard num. lock, secu. lock
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half-duplex Synchronous BSC EBCDIC 110-9600 Block Std. RS-232-C	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC Up to 19,200 Block Std. RS-232-C	Half/full-duplex Async./Sync. To spec. ASCII/EBCDIC 50-19,200 Char./block Std. RS-232-C	Half/full-duplex Synchronous BSC/SDLC EBCDIC/ASCII/APL 1200-56K Block Std. RS-232-C; coax A	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC/APL 1200-56K Block Std. RS-232-C; coax A
Integral modem Integral acoustic coupler	No No	No No	Opt. No	No No	No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 1/75 5/75 37,000 MDS Trivex	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 10/79 2/80 6,000 MDS Trivex	— 1,700-2,800 — 20-50 — 10/81 Megadata, third party	77-108 138-607 1,324-3,010 3,595-13,595 2-16 7/79 2/80 Memorex	133-200 138-607 3,635-5,591 3,595-13,595 28-37 8/82 12/82 Memorex
COMMENTS	Includes 712/722 controllers, 752 stand-alone, 712 minicluster, & 722 terminal; 722 attaches to MDS Trivex or IBM controllers	Includes 8074 controller & 8078 display; Trivex and/or IBM terminals attach to Trivex or IBM controllers in same cluster. 27 x 132 (3564 char.) screen arrangement avail. in 1983	8 bit microprocessor based terminal features noiseless operation and low power requirements; 2K EAPROM for user-selection of transmission rate, parity mode, stop bits, etc.	Separate controller (2076)	Includes: tiltable display, antiglare screen, audible alarm, unprotected field indicator, upper/lower case switch, energy efficient

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Microdata Prism IV	Micro-Term Mime 2A	Micro-Term Ergo 201/301	Micro-Term Ergo 2000	Micro-Term Mime 340
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. —	Stand-alone 1 No No Std. DEC VT52, Hazeltine 1500, Soroc 120	Stand-alone 1 No No Std. Televideo 925, Lear Sieglar ADM 3A	Stand-alone — No No Std. DEC VT52, Haz. 1500, LSI ADM 3A	Stand-alone — No No Std. Haz. 1500, LSI ADM 3A, DEC VT52
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920 80/25/1 25 x 80	1920 — 24 x 80	1920 1-2 pgs std. 24 x 80; 24 x 132 (301 only)	1920 — 24 x 80	1920 — 24 x 80
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 No 96 7 x 9 dot matrix P31 green std.	12 — 128 7 x 11 dot matrix P4 white	12 Tilt std. 128 ASCII 7 x 11 dot matrix P31 green; amber opt.	12 Tilt std. 128 5 x 7 dot matrix P31 green	12 No 128 7 x 9 dot matrix Green
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	No No No No Std. No Std. No Std. No Std. Both std. Opt. No — Fwd. std. No No Line/screen std.	No Std. Std. No Std. No Std. No Std. No Std. Std. Std. No Std. Std. Std. Std. Char./line/screen std.	No Std. Std. Std. — Std. No Up/down, smooth std. — Std. Std. Fwd./back std. Std. Std. Std.	No Std. Std. No Std. Std. Both std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Line/field/screen std.	No No No No Std. No Std. Std. Std. Std. Std. Std. Std. Std. Std. Line/field/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys	Typewriter 96 ASCII Std. No	Typewriter 128 ASCII No Std.	Typewriter 128 ASCII Std. 16 std.	Typewriter 128 ASCII Std. No	Typewriter 128 ASCII No 13 std.
Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Std. Opt. No No Std. —	Std. No No No Std. —	Std. No No No Std. —	Std. No No No Std. —	Std. No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half/full-duplex Asynchronous ASCII ASCII Up to 19,200 Character No RS-232-C	Half/full-duplex Asynchronous ASCII ASCII 110-9600 Char./line/block No RS-232-C, 20mA	Half/full-duplex Asynchronous ASCII ASCII To 19.2K — — RS-232-C, 20mA opt.	Half/full-duplex Asynchronous ASCII ASCII 300-19,200 Char./block No RS-232-C std., 20mA opt.	Half/full-duplex Asynchronous ASCII/ANSI ASCII 110-19,200 Block No RS-232-C
Integral modem Integral acoustic coupler	No No	No No	No No	No No	No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Purchase only — 1,295 — — 1/80 Microdata	Purchase only — 1,045 — 18-22 — 8/78 Western Union	— — 795-895 — — 1983 1983 Western Union	— — 1,095 — — 18-22 — Western Union	— — 750-995 — — 18-22 — Western Union
COMMENTS			Graphics option available		

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Nabu 3100 & 3100GX	Nabu 4404 & 4404/GX	Nabu 4604	Nabu 5000	Nabu 6100 & 6140GX
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. ANSI	Stand-alone 1 No No Std. Lear Siegler ADM 3A & Nabu 404	Stand-alone — No No Std. Lear Siegler ADM 3A & Nabu 4404	Stand-alone — No No Std. See comments	Stand-alone 1 No No Std. DEC VT100; Tektronix 4010, 4012, 4013
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920 1 pg. std.; 2nd opt. 24 x 80	1920 1920 char. 24 x 80	1920 — 24 x 80	1920 1920 char. 24 x 80	1920 1-4 pages 24 x 80
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 No 128 ASCII + 32 grph. 7 x 9 dot matrix P4 white std.; P31 green or amber opt. No	12 No 128 ASCII 7 x 9 dot matrix P4 white std.; P31 green or amber No	12 No 128 ASCII 7 x 9 dot matrix P4 white std.; P31 green or amber opt. No	12 No 128 ASCII — —	12 No 96 ASCII 7 x 12 dot matrix P31 green std. No
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size	Std. Std. Std. (3100 only) Std. Std. Std. Std.	No No No Dim Hdw. select No	No No No Dim Std. No	Std. Std. No Dim Std. No	Std. Std. — Std. Std. Std.
Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	Up/down; smooth 1 std.; 2 opt. No Both std. Std. Std. 3 std. Fwd./back std. Std. Std. Char./line/screen std.	Up std. No Std. Addressable only No No No No No No Line/screen std.	Up std. No Std. Addressable only No No No No No Line/screen std.	Smooth std. 1 std. Std. Std. Std. Std. Std. — — Line/screen std.	Up/down, smooth 1-4 Std. Both std. No No 3 std. Fwd. No No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys	Typewriter 96 ASCII Std. 16 user string Std.	Typewriter 96 ASCII Std. 10 std. Std.	Typewriter 128 ASCII Std. 10 std. Std.	Typewriter 128 ASCII Std. 16 std. Std.	Typewriter 96 ASCII Std. 16 user string, 8 std. Std.
Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	— No Opt. Opt. —	120 cps No Opt. Std. —	120 cps No Opt. Std. —	— No Opt. Std. —	— No No Std. No
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half/full-duplex Asynchronous ASCII ASCII 50-9600 Char./line/block No RS-232-C std.; 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C std.; 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C — No No	Half/full-duplex Asynchronous ASCII ASCII — Char./block — — — — No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C — No No
Integral modem Integral acoustic coupler PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,095 — — 9/81 — Third party	— — 695; 1,790 (GX) — — 5/82 (GX) 6/81; 9/82 (GX) — Third party	— — 695 — — 5/83 — Third party	— — 795 — — 5/83 — Third party	— — 3,695 — — — — Third party
COMMENTS	3100/GX features Tektronix 4010 graphics format; 512 x 250 resolu- tion; auto. scaling from 1024 x 780 resolution for Tektronix Plot 10 & Gino-F compatibility	4404/GX features Tektronix 4010 graphics format; 512 x 250 resolu- tion; auto. scaling from 1024 x 780 resolution for Tektronix Plot 10 & Gino-F compatibility	Retrofit graphics kit (plot 10 com- patible) optional	Emulates: Nabu 4604, 4152, 414H; Hazeltine Esprit; ADDS Viewpoint; others	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	NCR 7900 Model 1	NCR 7900 Model 3	NCR 7901	NCR 7910	NCR 7950
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. —	Stand-alone 1 No No Std. —	Stand-alone — No No Std. —	Stand-alone 1 No No Std. No	Cluster 32 No IBM 3270 SNA/SDLC No No
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 — 25 x 80 12 Std. 64/96/128 7 x 7 dot matrix Amber std. No Std. Std. No No Std. No Up std. No Std. Addressable only No No No No No No No Line/screen std.	2000 — 25 x 80 12 No 128 ASCII 7 x 7 dot matrix P31 green std. No Std. Std. Std. No No Std. Both std. No No Fwd./back std. Std. Std. Char./line/screen std.	1920 — 24 x 80 12 Tilt std. 96 ASCII 5 x 7 dot matrix P31 green std. No Std. Std. Std. No No Std. Addressable only No No No No No Screen std.	2000 12K 25 x 80, 25 x 132 15 Std. 128 ASCII, 32 graph. 7x9,5x9 dot matrix Amber std. — Std. Std. Std. Std. Up/down std. 4 pgs std. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	1920, 2560, 3564 — 24 x 80, 32 x 80, 27 x 132 15; 14 (color) Std. 96 ASCII 7 x 9 dot matrix P31 green std., amber opt. 7 colors std. Opt. Opt. Opt. Opt. Opt. No No Std. Addressable only Std. Std. Std. Std. Std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 64/96/128 ASCII Opt. 1 key (96 functions) Std.;touch-tone opt.	Typewriter 128 ASCII Opt. No Std.;touch-tone opt.	Typewriter 96 ASCII Std. No Std.	Typewriter 128 ASCII Std. Std.	Typewriter, data entry ASCII, EBCDIC Std. 24 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Thermal/impact No No Std. —	No No No Std. —	Serial interface No No Std. —	— — No Std. —	200 cps matrix No No No No Audible alarm
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line No RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII 50-9600 Line/page Both std. RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Character No RS-232-C No No	Half/full-duplex Asynchronous TTY ASCII No RS-232-C, RS-422 opt. No No	Half/full-duplex Synchronous SNA/SDLC ASCII, EBCDIC 1200-9600 Block std. Std. RS-232-C std. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	108(1 yr.);97(3 yr.) — 1,500 — 19 — 6/79 — NCR	173 (1 yr.); 162 (3) — 3,500-3,670 — 33 — — — NCR	— — 850 — 15 2/82 5/82 — NCR	159 (1 yr.); 135 (3) — 1,995 — 18 9/83 9/83 — NCR	68-140 255-460 1,395 6,000 46-75 7/83 7/83 — NCR
COMMENTS		Parallel interface std.		96 Int'l symbols, conforms to ANSI X3.64 and NCR 7900-1-4	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Northern Technologies Vision 1000	Northern Technologies Vision 2000+	Northern Telecom 298	Paradyne 9440	Paradyne 9476
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone NA No No Std. DEC VT100	Stand-alone NA No No Std. DEC VT100	Cluster 16 No 3270 BSC/SNA No —	Either 3 No 1052 No —	Either 32 No 3276-looks local No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	25 x 132 2 pages 80 or 132 x 25 12½, 15 opt. Tilt std. 96 ASCII 7 x 11 dot matrix P31 green std. No Std. Std. Std. Std. Std. Std. — Std. Std. Std. Std. No Std. Opt. Opt. Char./line/screen std.	25 x 132 31-248 lines 80 or 132 x 25 lines 12 or 15 Tilt std. 256 std., 512 opt. 9 x 15 dot matrix P31 green std./ black and white opt. No Std. Std. Std. Std. Std. Std. Up/down smooth std. 1 page std./8 opt. Std. Std. Std. Opt. 4 std. Std. Opt. Opt. Char./line/screen std.	1920, 2560, 3440 — 24 x 80, 32 x 80, 43 x 80 15 No 64, 96 7 x 9 dot matrix Green No No Std. Std. Addressable only Std. Std. No Std. No Std. No Char./screen std.	1920 — 24 x 80 12 Tilt std. 128 ASCII/EBCDIC 7 x 14 dot matrix P39 green No No No No Both std. No Std. No No No Std.	1920 — 24 x 80 15 Tilt std. 128 ASCII/EBCDIC 8 x 16 dot matrix P39 green No Std. Std. Std. Std. No Std. Both std. Std. Std. No Std. No Std. No Std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Typewriter 96 ASCII Std. 4 std. Std. Supported No Opt. Std. —	Typewriter 96 ASCII Std. 20 std. Std. Supported No Opt. Std. 26th line for function key labels	Typewriter, data entry, keypunch ASCII/EBCDIC Std. 12 opt. Opt. Impact, 66-180 cps No No Std. ID badge reader, light pen	Typewriter ASCII Std. 24 std. Opt. Impact No Opt. No Light pen, keylock	Typewriter, data entry, WP ASCII/EBCDIC Std. 24 std. Std. 45/150 letter/dot 300/600 band Opt. Opt. Light pen, keylock
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Full-duplex Asynchronous TTY ASCII 19.2K Char.; block opt. No RS-232-C, 20mA opt.	Full-duplex Asynchronous TTY ASCII 19.2K bits/sec. Char.; block opt. No RS-232-C, 20mA opt.	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC 1200-9600 Block Std. RS-232-C	Half/full-duplex Asynchronous Paradyne SDLC ASCII/EBCDIC Up to 19,200 Character No RS-232-C	Full-duplex Synchronous Paradyne SDLC ASCII/EBCDIC 256KB Block Std. RS-232-C
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 1,095 — — 4/83 5/83 — Northern Technologies	NA 1,495 — NA 9/83 10/83 — Northern Technologies	Contact vendor — — — — — 2/81 — NTI	134 33 3,000 1,000 27 11/80 1/81 200 Paradyne	166 95 5,850 2,500 30 11/80 1/81 400 Paradyne
COMMENTS	Features 32 line drawing/graphics characters	Additional features: 5-line non destruc- tive overlay window; 16 function keys can access 96 separate functions. 1.5K non volatile function memory; host switch- able function key memory			All remote connect- ed devices appear as local channel attached; no need for remote software; Paradyne CRTs use loop technology

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Paradyne 9478	Peripheral Technology Scat 10	Perkin-Elmer 550B/550E	Perkin-Elmer 550S	Perkin-Elmer 1251
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either 32 No 3278 No —	Either 5 No 3270 No —	Stand-alone 1 No No Std. —	Stand-alone 1 No No Std. —	Stand-alone 1 No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80 15 Tilt std. 128 ASCII/EBCDIC 8 x 16 dot matrix P39 green No Std. Std. Std. Std. Std. No No No Std. Both std. Std. Std. No Std. Std. No Std.	1920 — 24 x 80 plus status line 14 Std. — 7 x 9 dot matrix — No Std. Std. Std. Std. Std. No No No Std. Addressable Std. Std. No Std. Std. No Char./line/screen std.	1920 80/24/1 24 x 80 12 No 128 ASCII 5 x 9 dot matrix P4 white std.; P31 green/amber opt. No No No No No Up std. No No Addressable only No No No Fwd. std. No No Line/screen std.	1920 80/48/2 24 x 80 12 No 128 ASCII 5 x 9 dot matrix P4 white std.; P31 green/amber opt. No No Up/down std. 2 opt. No Both std. Std. No No Fwd./back std. Std. Std. Char./line/screen std.	2000 80/24/1 24 x 80 12 Tilt std. 128 ASCII, 32 forms 7 x 11 dot matrix P4 white std.; P31 green/amber opt. No Std. Std. Std. No Std. No Up std. No Std. Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, data entry, WP ASCII/EBCDIC Std. 24 std. Std.	IBM 3278 ASCII/EBCDIC Std. 24 std. —	Typewriter 128 ASCII No No Std. (550E)	Typewriter 128 ASCII No 8 std. Std.	Typewriter 128 ASCII Opt. 24/32 opt. Opt.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	45/150 letter/dot 300/600 band Opt. Opt. Light pen, keylock	No No No Std. —	Thermal, 96 cps Thermal, 180 lpm No Std. —	Thermal, 96 cps Thermal, 180 lpm No Std. —	Thermal, 96 cps No No Std. Light pen
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Full-duplex Synchronous Paradyne SDLC ASCII/EBCDIC 256KB Block No RS-232-C Opt. No	Half/full-duplex Synchronous BSC/SDLC EBCDIC/ASCII Up to 9600 Block Std. RS-232-C No No	Half/full-duplex Asynchronous — ASCII 110-9600 Character No RS-232-C; 20mA opt. No No	Half/full-duplex Asynchronous — ASCII 50-19,200 Char./block No RS-232-C; 20mA opt. No No	Half/full-duplex Asynchronous — ASCII 110-9600 Char./line/block Std. RS-232-C; 20mA opt. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	77 135 3,000 4,000 20 11/80 1/81 1,200 Paradyne	Contact vendor 795-2,995 — — 2/83 — — Peripheral Technology	Contact vendor — Contact vendor — — — — Perkin-Elmer	Contact vendor — Contact vendor — — — — Perkin-Elmer	Contact vendor — Contact vendor — — — — Perkin-Elmer
COMMENTS			International character sets/keyboards available	International character sets/keyboards available	International character sets/keyboards available

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Perry Data Systems 9200	Perry Data Systems 9310	Perry Data Systems 9460	Phaze Information Machines P3278	Phaze Information Machines P9020
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. Data General D200	Stand-alone 1 No No Std. Data General D200	Stand-alone 1 No BSC Std. DG/IBM/Datapoint/ ADDS	Cluster 32 No 3278 — Std.	Either 32 — IBM 3278/IBM P.C. No Std.
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920 1 page 24 x 80	1920 1 page 24 x 80	1920 1 page 24 x 80	1920 — 24 x 80 plus status line	1920 To 360K 24 x 80 plus status line
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	9 No 64 ASCII 5 x 7 dot matrix P31 green	12 No 64 ASCII 5 x 7 dot matrix P31 green	12 No 64 ASCII 5 x 7 dot matrix P31 green	12 Std. 128 EBCDIC 7 x 14 dot matrix P42 green	12 Std. 224 EBCDIC, 256 ASCII 7 x 14 dot matrix P42 green
Color capability Programmable field/char. highlighting via:	No —	No —	No —	— Std.	Opt. Std.
Underline Blink Blank Bold Reverse Double size	— — — — — —	— — — — — —	— — — — — —	Std. Std. Std. Std. Std. No	Std. Std. Std. Std. Std. No
Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	Up std. No No Both std. Std. No No No Std. No Screen std.	Up std. No No Both std. Std. No No No Std. No Screen std.	Up std. No No Both std. Std. No No No Std. No Screen std.	No No Std. Both std. Std. Std. No Std. Std. No Char./line/screen std.	No No Std. Both std. Std. Std. No Std. Std. No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys	Typewriter 64 ASCII No 6 std.	Typewriter 64 ASCII No 6 std.	Typewriter 64 ASCII No 10 std.	Typewriter, data entry EBCDIC Std. 24 std.	Typewriter, data entry EBCDIC Std. 24 std.
Numeric keypad	Std.	Std.	Std.	Std.	Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	80-col dot matrix — No Std. Cash drawers	Int. 80-col dot mat. — No Std. Cash drawers	Int. 40-col dot mat. — No Std. Cash drawers	No No No No Light pen	No No No No Light pen
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half/full-duplex Asynchronous — ASCII 110-9600 Character No RS-232-C, RS-422	Half/full-duplex Asynchronous — ASCII 110-9600 Character No RS-232-C, RS-422	Half/full-duplex Asynchronous — ASCII 110-9600 Character No RS-232-C, RS-422	Half/full-duplex Synchronous BSC/SDLC EBCDIC 1200-9600 Block Std. RS-232-C	Half/full-duplex Both BSC/SDLC EBCDIC/ASCII 1200-9600 Block Std. RS-232-C
Integral modem Integral acoustic coupler	No No	No No	No No	No No	No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,545 — — — — 250 Perry Data Systems	— — 3,495 — — — — 875 Perry Data Systems	— — 3,495 — — — — 400 Perry Data Systems	— — 1,545 — — 12/82 1/83 — Third party	— — 4,250 — — 9/83 11/83 — Third party
COMMENTS	POS terminals	POS terminals w/ internal 80 column dot matrix printer	POS terminals w/ internal 40 column dot matrix printer	Lightweight (31 pounds); designed for user mainte- nance; DIN compat- ible; auto video shutdown; IBM compatible	Designed for user maintenance; modular design; ergonomic features DIN compat- ible; auto video shutdown; compatible with IBM P.C.; parallel printer port

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Plantronics Vuphone 3200 Series	Plantronics Vuphone 3300 Series	Plantronics Vuset DS150C/DS150E	Prime PST 100	Protocol Computers PCI 51
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — Portable case No Std. —	Stand-alone — Portable case No Std. —	Stand-alone — No No Std. —	Stand-alone — No No Std. Prime	Stand-alone — No 5251 Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	32 700 chars. 1 x 32 7 x 1 No 55 Baudot/ASCII 14 segment Vacuum fluorescent No No No No No No No Right to left No No No No No No No No No No No No No Screen std.	32 8K chars. 1 x 32 7 x 1 No 55 Baudot/ASCII 14 segment Vacuum fluorescent No No No No No No No Right to left No No No No Std. Std. No Std. No No No Screen std.	128 16/8/1 8 x 16 3 No 64 ASCII 5 x 7 dot matrix P4 white No No No Std. Up/down std. No No No No No No No No No No No No Screen std.	1920 80/24/1 or 2 24 x 80 plus status line 15 Std. 128 ASCII & graph. 7 x 9 dot matrix P136 white, P31 green No Std. Std. Std. Std. Dim std. Std. No Up/down std. 1 or 2 std. Std. Std. Std. Std. No Fwd./back std. Std. Std. Std.	1920 — 24 x 80 plus status line 12 Std. 124 ASCII 7 x 10 dot matrix P146 green No Std. Std. No No Std. Both std. Std. Std. Std. Std. No No Std. Line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 58 Baudot/56 ASCII No No No	Typewriter 58 Baudot/56 ASCII No Yes No	Typewriter 96 ASCII Std. No No	Typewriter 128 ASCII Std. 22 std. Std.	IBM 5251 124 ASCII Std. 8 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Printer & tape —	No No No Printer —	No No No Std. Mag. stripe reader (DS 150E)	Opt. — No Std. —	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half-duplex Asynchronous TTY Baudot & ASCII 45/110 Character No Modem Std. Std.	Half/full-duplex Asynchronous TTY Baudot & ASCII 45/110 Character No Modem Std. Std.	Half/full-duplex Asynchronous Char. oriented ASCII 300; 110/300/1200 Character No RS-232-C Opt. No	Full-duplex Asynchronous TTY ASCII 50-19,200 Char./block No RS-232-C No No	Half/full-duplex Asynchronous — ASCII 110-19,200 Block No RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 350-411 — — 1/81 3/81 6,000 Bell System, Plantronics	— — 700-750 — — 8/82 3/83 New Plantronics	— — 998/925 — — 1/72; 8/82 3/72; 2/83 12,000/new Bell System (DS 150C), Plantronics	— — 1,595 — — 9/82 — — Prime	38 — 995 — — 3/83 — — PCI
COMMENTS				Supported on all Prime 50 Series computer systems by PRIMOS operating system; English, French character sets available	Emulates IBM 5251 when used with PCI 1051 protocol converter

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Protocol Computers PCI 78	Qume QVT 102	Qume QVT 103	Qume QVT 108	Racal-Milgo 4010 8A1
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No 3278 Std. —	Stand-alone — No No Std. ADDS Viewpoint, Haz. 1500, LSI ADM 3A/5	Stand-alone — No No Std. DCE VT100/132, VT52	Stand-alone — No No Std. TeleVideo 912/ 920, 925	Stand-alone 1 No No Bell 8A1 (40/3) —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 — 24 x 80 plus status line 12 Std. 124 ASCII 7 x 10 dot matrix P146 green No Std. Std. No Std. Std. No No Std. No Std. Both std. Std. Std. Std. Std. No Std. Std. Line/screen std.	1920 — 24 x 80 plus status line 12, 14 Std. 128 ASCII 7 x 9 dot matrix Green std.; amber opt. No Std. Std. Std. Std. Std. Std. Fwd./back std. Std. Std. Std.	1920, 3168 80/24/2 24 x 80/132 12 Std. 128 ASCII 7 x 9 dot matrix Green std.; amber opt. No Smooth std. 2 std., up to 4 Std. Std. Std. Std. Std. Fwd./back std. Std. Std. Std.	1920 80/24/2 24 x 80 plus status line 12-14 Std. 128 ASCII 7 x 9 dot matrix Green std.; amber opt. No Std. 2 std. Std. Std. Std. Std. Std. Fwd./back std. Std. Std. Std.	1920 3 std.; up to 8 opt. 24 x 80 15 Std. 127 ASCII 7 x 9 dot matrix Green std. No Std. 3 std., 8 max. No Addressable only Std. Std. No Fwd. std. Std. (also word) Std. Char./line/screen/ word std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	IBM 3278 124 ASCII Std. 12 std. Std.	Typewriter 128 ASCII Std. 4 std.	Typewriter 128 ASCII Std. 4 std./8 functions	Typewriter 128 ASCII Std. 11 std./22 functions	Typewriter ASCII Std. 6 std. Opt.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	— No No Std. —	— No No Std. —	— No No Std. —	160/200 cps matrix 200/300 lpm No Std. 120 cps 80-col. desk-top printer
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII 110-19,200 Block No RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII Up to 19,200 Char./block No RS-232-C; 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII Up to 19,200 Char./block No RS-232-C; 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII Up to 19,200 Char./block No RS-232-C; 20mA opt. No No	Half/full-duplex Asynchronous 8A1 ASCII Up to 4800 Block Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	38 — 995 — — 3/83 — — PCI	— — 695 — — 11/82 1/83 Qume	— — 1,095 — — 12/82 1/84 Qume	— — 895 — — 12/82 10/83 Qume	108 — 3,555 — 35 4/80 7/80 1,350 Racal-Milgo
COMMENTS	Emulates IBM 3278 Model 2 when used with PCI 1076 pro- tocol converter	Foreign character sets, screen saver automatic shutoff	Foreign character sets, screen saver automatic shutoff	Foreign character sets, screen saver automatic shutoff	One-, three-, & five-year leases also available

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Racal-Milgo 4015	Racal-Milgo 4220	Racal-Milgo 4276	Racal-Milgo 8278	Radio Shack DT-1
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Bell 8A1 —	Stand-alone 1 No No No Sperry	Stand-alone 1 No 3276/3275, BSC/SD No —	Cluster 32 No 3278 No Racal-Milgo 4270 Series	Stand-alone 1 No No Std. ADD5, Hazeltine, LSI, Televideo
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 8 pages 24 x 80 15 Std. 64/96 ASCII 7 x 9 dot matrix Green std. No No Std. Std. Std. No No No Std. 8 pages std. No Addressable only Std. Std. No Fwd. std. Std. (also word) Std. Char./line/screen/ word std.	1920 1 page 24 x 80 15 Std. 127 ASCII 7 x 9 dot matrix Green std. No Std. Std. Std. No No Up/down std. No Both std. Std. Std. No Fwd./back std. Std. Std. Std.	1920 — 24 x 80 15 Std. 96 ASCII/EBCDIC 7 x 9 dot matrix Green, std. No No Std. Std. No No Std. Both std. Std. Std. Fwd./back std. Std. No Char./line/screen std.	1920-3564 — 24/32/43 x 80, 27 x 132 15 Std. 128 ASCII 7x8/7x9 dot matrix Green No Std. Std. Std. No No Std. Both std. Std. Std. No Fwd./back std. Std. No Char./line/screen std.	1920 — 24 x 80 12 No — White No Std. Std. Std. No Std. No No Std. Std. No No No Std. No No —
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter ASCII Std. 6 std. Opt.	Typewriter ASCII Std. 4 std.; 22 opt. Opt.	Typewriter, data entry ASCII/EBCDIC Std. 24 std. Std.	Typewriter, data entry, TSO 128 ASCII Std. 24 std. Std.	Typewriter ASCII No No Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	160/200 cps matrix 200/300 lpm No Std. 120 cps 80-col. desk-top printer	160/200 cps matrix 200/300 lpm No Std. —	160/200 cps matrix 200/300 lpm No Std. 120 cps, 80-col. desk-top printer	160/200 cps matrix 200/300 lpm No No 120 cps desk- top printer	No No No — —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous 8A1 ASCII Up to 4800 Block Std. RS-232-C No No	Half/full-duplex Async./sync. Univac U200/UTS20 ASCII Up to 9600 Block Std. RS-232-C No No	Half/full-duplex Synchronous BSC EBCDIC/ASCII 9600 Block Std. RS-232-C No No	Half/full-duplex Synchronous BSC, SNA/SDLC EBCDIC/ASCII 9600 Block Std. RS-232-C No No	Half/full-duplex Asynchronous ASCII 85-19,200 Character No RS-232-C, parallel No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	129 — 4,155 — 35 6/82 8/82 560 Racal-Milgo	82 — 3,370 — 35 2/81 5/81 1,000 Racal-Milgo	109 — 3,550 — 35 9/80 1/81 2,000 Racal-Milgo	37-51 (5-yr.) — 1,640-2,556 — — 3/83 1st quarter 1983 536 Racal-Milgo	— — 699 — — 1/82 4/82 — Radio Shack
COMMENTS	Time, date & security password may be down-line loaded from host or master terminal; PF keys have ability to store 746 characters per system	One-, three-, & five-year leases also available; Univac mux-compatible	One-, three-, and five-year leases also available	Screen protect to prevent phosphor burn	Available at selected Radio Shack stores and dealers

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Raytheon PTS-100	Raytheon PTS-1000	Raytheon PTS-2000	Raytheon PTS-4000	Raytheon R2079
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Cluster 32 No 3271/3274 Std. Honeywell, Univac	Either 32 Handheld (34 lbs.) 3178 No —	Cluster 8/32 No 3274, 3276, 3278 No —	Cluster 32 — 3274, 3278, 3279 No —	Cluster 8/32 No 3279 No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	480, 960, 1920 — 12x40, 15x64, 12x80, 24 x 80, 30 x 64 15 No 64/96 ASCII 7 x 7, 7 x 9 P31 green No No No No No No No No No Std. Both std. Std. Std. No Fwd./back std. Std. No Char./line/screen std.	960, 1920 48K 12 x 80, 24 x 80 12 Std. 7 x 9 dot matrix P31 green; amber, white opt. No No Std. — Std. Std. Std. No Fwd./back std. Std. No Char./line/block std.	960-3564 12/24/32/43 x 80, 27 x 132 15 Yes 128 ASCII 7 x 14/7 x 9 P31 green Yes Yes Yes Std. Std. No No No Fwd./back std. Std. No Char./line/screen std.	960-3564 64K 12/24/32/43 x 80, 37 x 132 15 Std. 7 x 9 dot matrix P31 green; amber, white opt. 4 colors std. Std. Std. Std. 3 pgs. std. Std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/block std.	960, 1920, 2560 — 12 x 80, 24 x 80, 32 x 80 15 Opt. 128 ASCII 7 x 9 dot matrix — 2/4 colors No No Std. Std. No No Std. Both std. Std. Std. No Fwd./back std. Std. No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, data entry ASCII/EBCDIC No 2 std., 4 opt. Opt.	Typewriter, data entry ASCII/EBCDIC Std. 24 std. Opt.	Typewriter, data entry ASCII/EBCDIC Std. 24 std. Opt.	Typewriter, data entry ASCII/EBCDIC Std. 24 std. Opt.	Typewriter, data entry ASCII/EBCDIC std. Std. 24 std. Opt.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	30,50,100,120 cps 300, 600 lpm No Std. Card reader, mag. stripe reader	Impact;45,120,150cps 300, 600 lpm No Std. Light pen, screen printer, letter quality printer, card reader, OCR	Impact;45,120,150cps 300, 600 lpm No Std. Light pen, screen printer, letter quality printer, card reader, OCR	Impact;45,120,150cps 300, 600 lpm No Std. Light pen, screen printer, letter quality printer, card reader, OCR	Impact, 150 cps 300, 600 lpm No Std. Light pen, card reader, OCR
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Async./sync. BSC/SDLC ASCII/EBCDIC Up to 9600 Block Std. RS-232-C CCITT V.24 No No	Half-duplex Synchronous BSC/SDLC/ALC ASCII/EBCDIC Up to 19,200 Block — RS-232-C No No	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC Up to 19,200 Block Std. RS-232-C No No	Half-duplex Synchronous BSC/SDLC/ALC ASCII/EBCDIC Up to 19,200 Block Std. RS-232-C No No	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC Up to 19,200 Block Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 5/71 10/72 Over 175,000 disp. Raytheon	52 105-220 1,490 2,900-5,600 10 10/83 11/83 — Raytheon	56-66 116-258 1,775-2,500 Contact vendor 12-14 4/80 4/80 Over 50,000 displays Raytheon	72 146-281 1,775-3,000 4,200-7,400 13 10/83 11/83 — Raytheon	99 — 2,800 — 21 — — — Raytheon
COMMENTS	IBM compatibility includes IPARS, 3270 BSC, 3274 BSC/SDLC, 3271 SDLC		Permits field-up- gradability from small to large con- troller	Display head removable up to 18 inches from base, APL and text capabilities	For use with PTS- 2000 system

Alphanumeric Display Terminals

SUPPLIER AND MODEL	RCA VP-3301/VP-3303	RCA VP-3501	RCA VP-3801/VP-4801	Soroc Challenger 530	Sperry UTS 10
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 Briefcase — — —	Stand-alone 2 Briefcase — — —	Stand-alone 2 Briefcase — — —	Stand-alone 1 No No Std. Lear Siegler ADM 3, TeleVideo 9XX	Stand-alone — No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	960 — 24 x 40, 12 x 20 — Opt. 95 ASCII 6 x 8 dot matrix — 8 colors NTSC No Std. Std. No Std. Std. Up std. No Std. Both No No No Forward Std. No Line, screen std.	960 — 24 x 40, 12 x 20 — Opt. 95 ASCII 6 x 8 dot matrix — 8 colors NTSC No Std. Std. No Std. Std. Up std. No Std. Both No No No Forward Std. No Line, screen std.	1920 1 page — 12 No 95 ASCII 7 x 8 dot matrix P31 green No Std. Std. No Smooth No Std. Both No — Fwd./back opt. Std. No Line, screen std.	1920 1 page 24 x 80 plus status line 12 No 128 5 x 9 dot matrix P31 green std. No Std. Std. No Up std. No Std. Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 1920 char. 24 x 80 12 Opt. 128 ASCII 7 x 11 dot matrix P31 green No No No No No Up opt. No Over char. Both std. Std. Std. No Std. (Block mode) Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Membrane, typewriter 128 ASCII Std. No Std.	Membrane, typewriter 128 ASCII Std. No Std.	Membrane, typewriter 128 ASCII Std. 8 std. Std.	Typewriter 96 ASCII Std. 14 std. Std.	Typewriter, expanded function 128 ASCII Std. 12 std. Opt.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Std. Std. No	No No Std. No Acoustic coupler	No No Std. Std. Acoustic coupler	No No No Std. —	80 cps impact No No No Magnetic stripe reader
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII 110-19.2K Character No RS-232-C No No	Half/full-duplex Asynchronous ASCII 300 Character No 20mA Std. Opt.	Half/full-duplex Asynchronous ASCII 110-9600 Character Std. RS-232-C, 20mA, parallel Std. Opt.	Half/full-duplex Asynchronous ASCII 110-19,200 Char./line/block No RS-232-C, 20mA No No	Half/full-duplex Asynchronous TTY ASCII Up to 9600 Char./block No RS-232-C; 20mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 369/379 — — 4/81 4/81 5000 Factory	— — 399 — — 11/81 11/81 3000 Factory	— — 399/598 — — 6/83 9/83 — Factory	Purchase only 595 — — — 1/83 — Soroc Soft-start set-up for transmission rate, word struc- ture, display for- mat, and intensity; includes 15 business graphics characters	— — 1,428-1,720 — — See comments 6/80 3/81 5,000 Sperry Central Repair Service-\$91/year; unit is customer— installable; op- erator-selectable parameters
COMMENTS					

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Sperry UTS 20	Sperry UTS 30	Tab Products 132/15	Tandberg Data TDV 2200 Family	Tandem 6530
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Both 31 No 3270 opt. No Uniscope	Stand-alone — No No No Uniscope	Stand-alone 1 No No Std. DEC VT52/VT100/ VT132, Prime, HIS	Stand-alone — No 3101 Std. DEC VT100/VT52, DG, Datapac., Honey.	Stand-alone 1 No No Std. Tandem
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 4000 char. Up to 24 x 80, plus status 12 Opt. 96 ASCII 7 x 11 dot matrix P31 green No No Std. No Std. Std. No Up/down std. 2 pages Over char. Both std. Std. Std. No Std. Std. Std. Char./line/screen std.	1920 4000 char. 24 x 80, plus status 12 Opt. 96 ASCII 7 x 11 dot matrix P31 green No Std. Std. Std. Std. No Up/down std. 2 pages Over char. Both std. Std. Std. No Std. Std. Std. Char./line/screen std.	1920, 3168 4 pages 24 x 80, 24 x 132, plus status 15 Tilt std. 128 7 x 11 dot matrix P31 green std., P4 white opt. No Std. Std. Std. Std. Up/down/sm./jump 4 std. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Line/screen/memory std.	1920 24K std.; 40/56 opt. 24 x 80 plus status 15 Std. 128 ASCII 9 x 14 dot matrix P31 green No Std. Std. Std. Dim std. Std. Std. Std. Fwd./back std. Std. Std. Std.	2000 Up to 8 pages 25 x 80 15 Std. 128 ASCII 7 x 9 dot matrix P31 green No Std. Std. Std. Std. No Std. Std. Std. Std. Std. —
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, expanded function 96 ASCII Std. 22 std. Opt.	Typewriter, expanded function 96 ASCII Std. 22 std. Std.	Typewriter 96 ASCII Std. 26 std.; 8 down- loadable Std.	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter ASCII Std. 16 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	80/200 cps impact No No No Magnetic stripe reader	40/160 cps No No No Magnetic stripe reader	120/200 cps matrix No No No Opt. —	No No No Std. —	Std. No No — —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half-duplex Synchronous Uniscope/UTS 400 ASCII Up to 9600 Block Std. RS-232-C No No	Half-duplex Synchronous Uniscope ASCII 9600 Block Std. RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/blk./pg. No RS-232-C, 20mA No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block Std. RS-232-C, RS-422 std.; 20mA opt. No No	Half/full-duplex Async./sync. ASCII ASCII 50-19,200 Char./block Std. RS-232-C, 20mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	74-122* 257* 2,267 7,000 26-32 6/80 10/80 35,000 Sperry	177/1 yr.; 128/5 yr. — 3,235 — 33 6/83 9/83 — Sperry	105 — 2,100 — 22 2/81 4/81 Over 6,000 Tab	— — 1,875-2,050 — — 6/82 — — Tandberg Data	— — 3,200 — — 3/82 4/82 — Tandem
COMMENTS	*Five-year lease; operator-selectable parameters; customer set-up; UTS 20W cluster workstation attaches to UTS 4020 cluster con- troller	70HZ refresh rate	Also available with Tektronix 4010 graphics emulation as Model 132/15-G and Honeywell VIP 7200/7800 emulation as Model 132/15-H	TDV 2200 Family currently consists of 11 models	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	TEC ET80/ET100	TEC 630	TEC 631/632	Tektronix 4025A	Tektronix 4100 Series
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. TEC 70; DEC VT100 (ET100 only)	Stand-alone 1 No No Std. Upon request	Stand-alone 1 No No Std. Upon request	Stand-alone 1 No No Std. DEC VT100 opt.	Either — — — Std. DEC VT100
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 5 pages 24 x 80 plus status line 15 Std. 256 7 x 12 dot matrix Black on white background No Std. Std. Std. No Std. Std. Up/down/jump/sm. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std.	2000 Up to 4 pages 25 x 80 12 Opt. 128 6 x 8 P4 white std.; P31 green opt. No Std. Std. Std. Reduced std. Std. No Std. 2/4 opt. Std. Both std. Std. Std. Std. Std. Fwd./back/auto Std. Std. Line/page/screen/ memory std.	2000 4 pages 25 x 80 12 Opt. 128 ASCII 6 x 8 dot matrix P4 white std.; P31 green opt. No Std. Std. Std. Reduced std. Std. 2/4 opt. Std. Both std. Std. Std. Std. Fwd./back/auto std. Std. Std. Line/page/screen/ memory std.	2720 16K/400/12 total 34 x 80 12 No 96 std. 7 x 9 dot matrix P39 green No Std. Std. Std. Std. Std. Up/down std. Std. No Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	2560 To 256K 30 x 80, 32 x 80 13, 19 model dep. Opt. 224 ASCII 6x9, 8x14 dot matrix P22 8 colors std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Both std. Std. No Std. Std. Fwd./back std. Std. Std. Std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 256 ASCII Std. 18 std. Std.	Typewriter 128 ASCII Std. 6 std. Opt.	Typewriter 128 ASCII Std. 6 std. Opt.	Typewriter ASCII Std. 20 plus all keys std. Std.	Typewriter ASCII Std. Std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. Card reader/writer	No No Opt. Std. Mag card reader/ writer	No No Opt. Std. Mag card reader/ writer	Serial opt. No Std. Std. Tape, plotters	— — No — —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII Up to 19,200 Char./block/line No RS-232-C; 20/60 mA opt. No No	Half/full-duplex Asynchronous — ASCII 110-9600 Char./line/block No RS-232-C std.; 20mA opt. No No	Half/full-duplex Asynchronous — ASCII 110-9600 Char./line/block No RS-232-C std.; 20mA opt. No No	Full/std.; half/opt. Asynchronous ASCII ASCII 75-9600 Char./block No RS-232-C, 20mA No No	Full-duplex Asynchronous ASCII ASCII To 38.4K Character No RS-232-C, Centronics No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 1,975 — — 6/82 — TEC	— — 1,475-1,995 — — 3/81 5/81 — TEC	— — 1,310 — — 9/80 11/80 800 TEC	273 — 5900 — 7 1977 1977 — Tektronix	Contact vendor — 3,995-9,950 — — Contact vendor 4/83 10/83 — Tektronix
COMMENTS	Model ET100 features vertical scrolling to display 132- character lines	Available in rack- mount or mag card reader/writer ver- sions		Updated to 4025A in 1981 w/new features, 3X speed, 4027A color terminal also available	132-character mode through vertical scrolling

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Teleram Portabubble 81/ Portaram 91	Teleray Model 7	Teleray Model 16/7801	Teleray Model 16/ 16 APL	Teleray Model 100
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either 1 Portable case No Std. —	Stand-alone — No No Std. ANSI X3.64	Stand-alone — No No Std. Honeywell VIP 7801	Stand-alone — No No Std. ANSI X3.64	Stand-alone — No No Std. DEC VT52/VT100/ VT132; ANSI X3.65
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	544, 816 62K/13K (P91) 16 x 34, 15 x 54 5 No 128 ASCII 7 x 9 dot matrix White No No Std. No Std. No Dim std. Std. No Up/down std. Full memory std. No No No No No Fwd./back std. Std. Std. Char./line/screen std.	1920 3840 char. 24 x 80 or user-de- fined, plus stat Ln. 12; 9 & 15 opt. Opt. 256, incl. 128 ASCII 8 x 10 dot matrix White, green, amber No Std. Std. Std. Std. Dim std. Std. 2x, 4x and 8x std. Up/down/horiz./sm. 2 std.; 4 opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen/ memory std.	1920 8 pages 24 x 80 plus status line 12; 9 & 15 opt. Opt. 128 ASCII + graphics — — Std. Std. Std. Dim std. Std. Std. Fwd./back std. Std. Std. Char./line/screen/ memory std.	1920 7760 char. 24 x 80 or user-de- fined, plus stat 12; 9 & 15 opt. Opt. 128 ASCII/64 graph. 8 x 10 dot matrix White std.; green, amber opt. No Std. Std. Std. Dim std. Std. No Up/down/horiz./sm. 4 std.; plus 4 opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen/ memory std.	3168 3168 char. 24 x 40, 24 x 66, 24 x 80, 24 x 132 12; 15 opt. Opt. 128 ASCII/32 graph. 7 x 9 dot matrix White, green, amber No Std., & overline Std. Std. Std. Std. Std. Up/down/smooth No Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. EOL/line/page/ EOP/memory std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII, 64 No No No No	Typewriter 128 ASCII Std. 32/64 user-defin. Std. & calc. mode No	Typewriter 128 ASCII Std. 32/64 user- definable Std.	Typewriter 96 ASCII + 32 ctrl. Std. 32/64 user-defin. Std. & calc. mode	Typewriter 128 ASCII+32 graph. Std. 20 functions/880 char. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No — —	No Opt. Std. full perform. —	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full duplex Asynchronous — ASCII, TTS, Baudot 50-9600 Char./block No RS-232-C, acoustic coupler No Std.	Half/full-duplex Asynchronous ASCII ASCII/ANSI To 19,200 Char./line/block No RS-232-C/20mA opt.	Half/full-duplex Asynchronous ANSI/ASCII ASCII 50-19,200 Char./line/block No RS-232-C std.; RS-422 opt. No No	Half/full-duplex Asynchronous ASCII ASCII/ANSI Up to 19,200 Char./line/block No RS-232-C; 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII/ANSI Up to 19,200 Char./line/block No RS-232-C; 20mA opt. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 3,995/2,995 (P91) — — — — — Teleram	74 — 1,295 — 11/82 1/83 — Teleray	Contact vendor 1,795-1,995 — 5/83 — — Teleray	87/96 (APL) 1,545/1,665 (APL) — 3/82 4/82 — Teleray	99 1,595 — — 12/80 — Teleray
COMMENTS	Weights 12½ pounds; Portabubble 91 is identical to P81, but without bubble memory, for news- paper applications	Additional 3840 char. mem. opt.— volatile or non- volatile; user-de- finable logical line and page lengths; 100+ user-configur- able control se- quences; graphics char. sets		Add. 7680 char. mem. opt.—volatile or non-volatile; user- definable logical line & page length; realtime clock read- out; alpha-only/ numeric-only modes; Model 16 APL in- cludes 96 APL char.	Four scrolling speeds: 5/10/15/ 20 lps.

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Teletype 4420	Teletype 4424	Teletype 4430	Teletype 4540	Teletype 4543
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. Teletype 40/1, 40/2	Stand-alone 1 No No Std. DEC VT100	Stand-alone 1 No No Std. Teletype 33, 35, 40/3 (multi-pt.)	Cluster 32 No 3270 BSC, SDLC No —	Stand-alone 1 No SDLC only No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 5,760 char. 24 x 80 12 Tilt std. 128 ASCII 7 x 9 dot matrix P4 white std. No Std. Std. No No Std. Std. No Up/down std. 3 std. No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 3,840 char. 24 x 80 13 Tilt std. 96 ASCII + 32 graph. 8 x 14 dot matrix P4 white std. No Std. Std. No No Up/down std. 2 std. Std. Both std. No No 1 std. Fwd./back std. Std. Std. Char./line/screen std.	1920 5,760 char. 24 x 80 13 Tilt std. 128 ASCII 7 x 9 dot matrix P4 white std. No Std. Std. No No Up/down std. 3 std. No Addressable only Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 1920 char. 24 x 80 13 Tilt std. 97 ASCII/EBCDIC 7 x 9 dot matrix P4 white std. No No Std. Std. No No No Both std. Std. Std. No Std. Std. Std. Char./line/screen std.	1920 1920 char. 24 x 80 13 Tilt std. 64 EBCDIC 7 x 9 dot matrix P4 white std. No No Std. Std. No No No Both std. Std. Std. No Std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 10 std. Std.	Typewriter 128 ASCII Std. 16 std. Std.	Typewriter 128 ASCII Std. 1 std. Opt.	Typewriter, data entry 96 ASCII/EBCDIC Std. 12 std. Opt. (typewr. keyb.)	Typewriter, data entry 64 EBCDIC Std. 12/24 std. Opt. (typewr. keyb.)
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	30/340 cps impact 300 lpm belt No Std. —	30 cps impact 300 lpm belt No Std. —	30/340 cps impact 300 lpm belt No Std. Comm-Stor 2	30/340 cps impact 300 lpm belt No No Mag card reader	30/340 cps impact 300 lpm belt No No Mag card reader
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII Up to 9600 Char./line/blk/page No RS-232-C; 20/60 mA No No	Full-duplex Asynchronous ASCII ASCII Up to 9600 Character No RS-232-C; 20/60 mA No No	Half-duplex Async./sync. 8A1, 85A1 opt. ASCII Up to 4800 Char./line/blk/page Std. RS-232-C; 20/60 mA No No	Half-duplex Synchronous BSC, SDLC ASCII/EBCDIC Up to 9600 Block Std. RS-232-C No No	Half/full-duplex Synchronous SDLC EBCDIC Up to 9600 Block Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 4,105 Incl. 19 11/80 10/80 — Teletype	— — 4,207 Incl. 19 10/81 1/82 — Teletype	— — 3,977 Incl. 19 6/81 12/81 — Teletype	Purchase only — 1,952 6,682 (cluster-32) 30(cluster)19(disp.) 3/79 9/79 — Teletype	Purchase only — 4,745 Incl. 19 5/81 — Teletype
COMMENTS	10 user-programmable function keys	ANSI 3.64 std. escape sequences; compatible w/UNIX; line drawing set std., buffered printer port; 16 oper.-programmable function keys	2 send and 3 receive buffers share buffer pool of 16K, 32K opt.; aux. port accommodates model 43RO, Model 43RT set, and Model 40 printer	Controllers for local connect or remote operation; local & remote self- diagnostics; also available from AT&T (Bell System) as Dataspeed 4540	Also available from AT&T (Bell System) as Dataspeed 4540

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Teletype 5410	Teletype 5420	Teletype 5540	TeleVideo 910	TeleVideo 910 Plus
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. ANSI X3.64 (where applicable)	Stand-alone — No No Std. ANSI X3.64 (where applicable)	Cluster 32 — 3270 No —	Stand-alone 1 No No Std. See comments	Stand-alone 1 No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920, 3168 1 page 24 x 80/132 plus 3 status 12 Tilt std. 128 ASCII, 96 graph. 5x7/7x9 dot matrix White No Std. Std. Std. Half-intensity Std. No Std. 1 std. Std. Addressable std. — 2 std. Std. Std. Std. Line/screen std.	1920, 3168 9600 char. 24 x 80/132 plus 3 status 12 Tilt std. 128 ASCII, 96 graph. 5x7/7x9 dot matrix White No Std. Std. Std. Half-intensity Std. No Std. Std. Std. Std. Std. Std. Std. Std.	1920, 3564 — 24 x 80, 27 x 132 (13-inch only) 12; 13 Tilt std. 96 EBCDIC 5x14/7x10 dot mat. White No No Std. No No Both std. Std. Std. Std. Std. Std. Char./line/screen std.	1920 80/24/1 24 x 80 12 Swivel std. 128 ASCII 6 x 7 dot matrix P31 green No Std. Std. Std. No Std. Up/down std. 1 std. Std. Both std. No No Fwd./back std. No No Line/screen std.	1920 80/24/1 24 x 80 12 Swivel std. 128 ASCII 6 x 7 dot matrix P31 green No Std. Std. Std. No Std. Up/down std. 1 std. Std. Both std. No No Fwd./back std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter 128 ASCII Std. 16 std. Std.	Typewriter, data entry 96 EBCDIC Std. 24 std. Std.	Typewriter 128 ASCII No No Std.	Typewriter 128 ASCII No No Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	— — No Std. —	— — No Std. —	30-340 cps dot mat. 220-300 lpm No Std. Light pen	No No Opt. Std. —	No No Opt. Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ANSI/ASCII ASCII Up to 19,200 Character No RS-232-C No No	Half/full-duplex Asynchronous ANSI/ASCII ASCII Up to 19,200 Char./block Std. RS-232-C No No	Half/full-duplex Synchronous BSC, SNA/SDLC ASCII/EBCDIC Up to 9600 Block Std. RS-232-C No No	Half/full-duplex Asynchronous — ASCII 50-19,200 Character No RS-232-C; 20mA opt. Opt. No	Half/full-duplex Asynchronous — ASCII 50-19,200 Char./line/block No RS-232-C; 20mA opt. Opt. No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 995 — — 4/83 3rd quarter 1983 — Teletype	— — 1,495 — — 4/83 3rd quarter 1983 — Teletype	Contact vendor Contact vendor 1,633-up 4,500-11,500 — 4/83 3rd quarter 1983 — Teletype	Purchase only — 699 — — 5/81 5/81 10,000 GE Instr. & Comm.	Purchase only — 699 — — — 2/82 2/82 — GE Instr. & Comm.
COMMENTS				Emulations include: ADDS Regent 25, Hazeltine 1410, & Lear Siegler ADM 3A/5	

Alphanumeric Display Terminals

SUPPLIER AND MODEL	TeleVideo 914	TeleVideo 924	TeleVideo 925	TeleVideo 950	TeleVideo 960
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. TeleVideo 910 Plus, ADDS Viewpoint	Stand-alone — No No Std. TeleVideo 925/ 950	Stand-alone 1 No No Std. TeleVideo 912/920	Stand-alone 1 No No Std. —	Stand-alone — No No Std. DEC VT100
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1 page; 2 opt. 24 x 80 plus status line 12 Std. 128 ASCII 6 x 7 dot matrix P31 green No Std. Std. Std. No Std. No Std. Std. 1 std. Std. Both std. Std. No No Fwd./back std. Std. Std. Char./line/screen std.	1920 4 pages 24 x 80 plus status line 12 Std. 128 ASCII+graphics 6 x 8 dot matrix P31 green No Std. Std. Std. Std. No Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	1920 80/24/2 24 x 80 12 Std. 128 ASCII 6 x 8 dot matrix P31 green No Std. Std. Std. Std. No Up/down std. 2 opt. Std. Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 80/24/4 24 x 80 12 Std. 128 ASCII 10 x 7 dot matrix P31 green No Std. Std. Std. Std. No Up/down std. 4 opt. Std. Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920, 2112 — 24 x 80, 16 x 132 12 Std. 128 ASCII 7 x 8 dot matrix P31 green No Std. Std. Std. Std. Std. No Up/down std. Std. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/field std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 16 std. Std.	Typewriter 128 ASCII Std. 32 std. Std.	Typewriter 128 ASCII Std. 22 std. Std.	Typewriter 128 ASCII Std. 22 std. Std.	Typewriter 128 ASCII Std. 16 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —	No No Opt. Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII 150-19,200 Char./block No RS-232-C Opt. No	Half/full-duplex Asynchronous — ASCII Up to 19,200 Char./block No RS-232-C Opt. No	Half/full-duplex Asynchronous — ASCII 50-19,200 Char./line/block No RS-232-C Opt. No	Half/full-duplex Asynchronous — ASCII 50-19,200 Char./line/block No RS-232-C Opt. No	Half/full-duplex Asynchronous ANSI X3.64 ASCII Up to 19,200 Char./block No RS-232-C Opt. No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 699 — — 4/83 — — GE Instr. & Comm.	— — 895 — — 4/83 — — GE Instr. & Comm.	Purchase only — 995 — — 11/81 11/81 10,000 GE Instr. & Comm.	Purchase only — 1,195 — — 2/81 2/81 40,000 GE Instr. & Comm.	— — — — — 4/83 — — GE Instr. & Comm.
COMMENTS					

Alphanumeric Display Terminals

SUPPLIER AND MODEL	TeleVideo 970	Telex 276	Telex 277	Telex 278	Telex 279
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No No DEC VT100	Both 8 No 3276 BSC/SDLC No —	Cluster 32 No 3277 No —	Cluster 32 No 3278 BSC/SDLC No —	Cluster 32 No 3279 No —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 80/132, 24, 3/2 24 x 80, 24 x 132 14 Tilt std. 128 7 x 8 dot matrix P31 green No Std. Std. Std. Std. Std. Std. Up/down std. 3 std. Std. Std. Std. Std. 3 std. Fwd./back std. Std. Std. Char./line/field std.	1920-3564 — 24 x 80, 32 x 80, 43 x 80, 27 x 132 15 Yes 96 EBCDIC/ASCII 9 x 14 dot matrix White std., green opt. No No No No No Std. No No Both std. Std. Std. No Fwd./back std. Std. No Char./screen std.	1920 — 24 x 80 15 Yes 96 7x9/7x8 dot matrix White std., green opt. No No No No Std. Std. No Std. Std. No Fwd./back std. Std. No Char./line/screen std.	1920-3564 — 24 x 80, 32 x 80, 43 x 80, 27 x 132 15 Yes 96 EBCDIC/ASCII 9 x 14 dot matrix Green or white No No No No Std. No Both std. Std. Std. No Fwd./back std. Std. No Char./screen std.	1920 — 24 x 80 15 Yes 96 EBCDIC/ASCII 9 x 14 dot matrix — 4 colors std. No No No No Std. No No Both std. Std. Std. No Fwd./back std. Std. No Char./screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 32 non-volatile Std.	Typewriter, data entry 64 ASCII/94 EBCDIC Std. 24 opt. Opt.	Typewriter, data entry ASCII/EBCDIC Std. Opt. Std.	Typewriter, data entry 64 ASCII/96 EBCDIC Std. 24 opt. Opt.	Typewriter, data entry ASCII/EBCDIC Std. Opt. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Opt. Std. No	Std. — No Std. Security lock, audible alarm, light pen	Std. Std. No Std. Audible alarm, light pen, mag. stripe reader opt.	Std. No No Std. Security lock, audible alarm, light pen	Std. No No Std. Security lock, audible alarm, light pen
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ANSI X3.65 ASCII 50-19.2K Char./line/fld./blk. No RS-232-C, RS-422, 20mA Opt. No	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC 2400-9600 Block Std. RS-232-C No No	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC 2400-9600 Block Std. RS-232-C No No	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC 2400-9600 Block Std. RS-232-C No No	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC 2400-9600 Block Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,495 No No 6/82 1/83 — GE Instr. & Comm.	184 — 5,300 24 6/79 8/79 — Telex Service Co.	64 — 1,590 10 1/74 3/74 — Telex Service Co.	55-82 — 2,100-2,800 — 7-10 6/79 8/79 — Telex Service Co.	— — 3,500 — — 1/82 1st Q. 1982 — Telex Service Co.
COMMENTS		Terminal response time indicator is available for all Telex models			Red, green, blue, & white standard colors

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Telex 178	Telex 476	Termiflex HT/2	Termiflex HT/3-HT/4	Termiflex HT/6-HT/7- HT/8
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Cluster 32 No 3278 BSC/SDLC No —	Either Up to 16 No 3270 No —	Stand-alone — Hand-held — Opt. Opt.	Stand-alone — Hand-held — Opt. Opt.	Stand-alone — Hand-held — Opt. Opt.
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920 — 24 x 80	1920 — 24 x 80	20 1000 2 x 10	12(HT/3); 24(HT/4) 12/24 1 x 12/2 x 12	20(6)/40(7)/80(8) 940/960/1000 1/2/4 x 20
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 Yes 96 — Green or white	15 Yes 96 EBCDIC 8 x 15 dot matrix White std.; green opt. No	— — 96/128 selectable 5 x 7 dot matrix Red LED	— — 96 5 x 7 dot matrix Red LED	— — 96/128 selectable 5 x 7 dot matrix Red LED
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	No — No No No Std. No No No Std. Both std. Std. Std. No Fwd./back std. Std. No Char./screen std.	No — No No No Std. No No No Std. Both std. Std. Std. No Std. Std. No Char./screen std.	— — No No No No Up/down std. No No Opt. No No No No Via backspace No No	— — No No No No No No No No No Opt. No No No No No No No	— — No No No No No No Up/down std. No No Opt. No No No No Via backspace No No
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter, data entry 64 ASCII/96 EBCDIC Std. Opt. Std.	Typewriter, data entry EBCDIC Std. 12/24 std. Std.	20 keys + 3 shift 128 ASCII No No Std.	20 keys + 3 shift 128 ASCII No No Std.	20 keys + 3 shift 128 ASCII No No Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	Std. Std. No Std. —	No No No No —	No No No No —	No No No No —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half-duplex Synchronous BSC/SDLC ASCII/EBCDIC 2400-9600 Block Std. RS-232-C No No	Half/full-duplex Synchronous BSC/SDLC EBCDIC Up to 9600 Block Std. RS-232-C No No	Half/full-duplex Asynchronous Bit serial ASCII 110-1200 (2400 opt.) Character Opt. RS-232-C, TTL, 20mA No No	Full std./half opt. Asynchronous Bit serial ASCII 110-1200 (2400 opt.) Character Opt. RS-232-C, TTL, 20mA No No	Half/full-duplex Asynchronous Bit serial ASCII 110-1200 (2400 opt.) Character No RS-232-C, TTL, 20mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Contact vendor — Contact vendor — Contact vendor 2/82 — — Telex Service Co.	— — 3,700 — — 5/82 8/82 — Telex Service Co.	— — 2,495 — — — — Factory	— — 795/1,195 — — — — Factory	— — See Comments — — — — Factory
COMMENTS	Small screen & cabinet version of the 278		Quantity discounts available	Quantity discounts available	Purchase prices: HT/6—\$1,795; HT/7—\$7,595; HT/8—\$3,995; Quantity discounts available

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Termiflex HT/6B-HT/7B- HT/HB	Termiflex HT/10-HT/11- HT/12	Termiflex HT/20	Termiflex HT/1000	Termiflex CD/20
TERMINAL DESCRIPTION					
Stand-alone or cluster	Stand-alone	Stand-alone	Stand-alone	Stand-alone	Stand-alone
Maximum displays/controller	—	—	—	—	—
Transportability	Hand-held	Hand-held	Hand-held/panel	Hand-held	Hand-held/panel
IBM compatibility	—	—	—	—	—
Teletype compatibility	—	Opt.	Opt.	—	Opt.
Other compatibility	—	Opt.	Opt.	—	Opt.
DISPLAY PARAMETERS					
Display capacity, no. of chars.	20-80 (dep. model)	12(10)/16(11)/32(12)	16	64	16
Memory capacity, no. char./lines/pages	20-80 (dep. model)	12/16/32	16	64	16
Screen arrangement, lines x chars./line	1 x 20; 4 x 20	1 x 12 (10)/16 (11-12)	1 x 16	4 x 16	1 x 16
Screen area, diagonal, inches	—	—	—	—	—
Tilt/swivel screen	—	—	—	—	—
Total displayable symbols	95 ASCII	96; 128 opt.	96	95 ASCII	96
Symbol formation	5 x 7 dot matrix	16/18 ele. starburst	18 ele. starburst	5 x 7 dot matrix	18 ele. starburst
Character phosphor	Red LED	Red LED	Red LED	Red LED	Red LED
Color capability	—	—	—	—	—
Programmable field/char. highlighting via:					
Underline	No	No	No	No	No
Blink	Std.	Std./opt.	Opt.	Std.	Opt.
Blank	Std.	No	No	Std.	No
Bold	No	No	No	No	No
Reverse	No	No	No	No	No
Double size	No	No	No	No	No
Scroll	No	Up/down opt.	No	No	No
Paging	No	No	No	No	No
Selectable cursor blinking	No	No	No	No	No
Addressable/readable cursor	Std.	No	No	Std.	No
Protected format	No	No	No	No	No
Partial screen transmit	No	No	No	No	No
Split screen/windows	No	No	No	No	No
Tabulation	No	No	No	No	No
Character insert/delete	—	Via backspace	Via backspace	—	Via backspace
Line insert/delete	No	No	No	No	No
Erase	No	No	No	No	No
KEYBOARD PARAMETERS					
Style	24 keys	20 keys + 3 shift	20 keys + 3 shift	32 keys	24 keys
Character/code set	128 ASCII	128 ASCII	128 ASCII	128 ASCII	24 ASCII
Detachability	No	No	No	No	No
Program function keys	No	No	No	4 std.	No
Numeric keypad	Std.	Std.	Std.	Std.	Std.
ANCILLARY DEVICES					
Serial printer, type and speed	No	No	No	No	No
Line printer, type and speed	No	No	No	No	No
Composite video	No	No	No	No	No
Port for cust.-supplied devices	Std.	No	No	Std.	No
Other vendor-supplied devices	No	—	—	—	—
TRANSMISSION PARAMETERS					
Mode	Full-duplex	Full std.; half opt.	Full, half opt.	Half/full-duplex	Full, half opt.
Technique	Asynchronous	Asynchronous	Asynchronous	Asynchronous	Asynchronous
Communications protocol	Bit serial	Bit serial	Bit serial	Bit serial	Bit serial
Code	ASCII	ASCII	ASCII	ASCII	ASCII
Speed, bits/second	1200	300/1200 std. (9600)	300/1200/9600	150-19.2K	300/1200/9600
Format; character, line, or block	Character	Character	Character	Character	Character
Multipoint operation (pollable/addr.)	No	No	No	No	No
Terminal interface	RS-422	RS-232-C, TTL, 20mA, RS-422	RS-232-C, TTL, 20mA, RS-422	RS-232-C, TTL, 20mA; RS-422 opt.	RS-232-C, TTL, 20mA, RS-422
Integral modem	No	No	No	No	No
Integral acoustic coupler	No	No	No	No	No
PRICING AND AVAILABILITY					
Display station, 2-year lease, \$/mo.	—	—	—	—	—
Controller, 2-year lease, \$/mo.	—	—	—	—	—
Display station, purchase, \$	2,980-5,180	495/745/995	495	795	495
Controller, purchase, \$	—	—	—	—	—
Monthly prime-shift maint., \$/mo.	—	—	—	—	—
Date of announcement	—	—	—	—	—
Date of first production delivery	—	—	—	—	—
Display units installed to date	—	—	—	—	—
Serviced by	Factory	Factory	Factory	Factory	Factory
COMMENTS		Quantity discounts available	Quantity discounts available		Quantity discounts available

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Term Tronics 3270-A/3270-B	Term Tronics MEGA II	Texas Instruments 931	Tymshare Scanset 410/415/415HS	Visual 50
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either 12 Handcarry 3275/76/74, BSC Std. DEC VT100 & others	Cluster 32 Handcarry BSC/SDLC 3278 Std. DEC VT100 & others	Stand-alone — No No Std. —	Stand-alone 1 No No Std. —	Stand-alone — No No Std. See comments
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920/3168 3168 24 x 80, 24 x 132 14 Tilt std. 128 ASCII 7 x 9 P31 green std. Four; 3 opt. — No Std. Std. Std. Std. Std. Smooth No Std. Both std. Std. Std. in ASCII mode Std. in ASCII mode Forward/back std. Std. No Char./field/screen std.	1920/3564 3564 24 x 80, 27 x 132 14 Tilt std. 128 ASCII 7 x 9 P31 green std. No — No Std. Std. Std. Std. Smooth No Std. Both std. Std. Std. in ASCII mode Std. in ASCII mode Forward/back std. Std. No Char./field/screen std.	2000 1 page 25 x 80 12 Tilt std. 128 7 x 9 dot matrix Green No Std. Std. Std. Std. No Up/down std. No Std. Both std. Std. Std. Fwd./back std. Std. Std. Char./line/field/ screen std.	960, 1920 — 24 x 40, 24 x 80 plus status line 9 No 96 ASCII 5 x 9 dot matrix P4 white No No No No No No No No No No No No No No No No No —	1920 — 24 x 80 plus status line 12 Std. 128 ASCII 7 x 9 dot matrix White; P31 green opt. No Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Std. Line/field/page std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	Typewriter 96 EBCDIC, 128 ASCII Std. 24 std. Std. 120-160 cps Opt. Opt. Personal Computer	Typewriter 96 EBCDIC, 128 ASCII Std. 24 std. Std. 120-160 cps Opt. Std. Personal Computer	Typewriter 96 ASCII Std. 12 std. Std. EIA, 35-150 cps No No Std., EIA output only No	Typewriter ASCII No 6 std.; 24 functions No No No Std. —	Typewriter 128 ASCII Std. No Std. No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	Half-duplex Async./sync. BSC ASCII/EBCDIC 300-9600 Character/block Std. RS-232-C Opt. No Contact vendor — — — 5/82 6/82 — RCA	Half-duplex Async./sync. BSC/SDLC ASCII/EBCDIC 300-9600 Character/block Std. RS-232-C, coax No No Contact vendor — — — 7/83 8/83 — RCA	Full-duplex Asynchronous TTY ASCII 300-19,200 Character No RS-232-C std., fiber optics opt. No — 1,295(EIA); 1,350f.o. 19 4/83 9/83 — Texas Instruments	Half/full-duplex Asynchronous BSC/SDLC ASCII 75-1200 Character No RS-232-C 415 and 415HS only No — 495; 649; 1,295 — 2/82 — — Tymshare	Half/full-duplex Asynchronous ANSI ASCII 75-19,200 Char./block — RS-232-C; 20mA opt. No — 695 — 6/82 7/82 — Visual Technology
COMMENTS			Can be simulta- neously connected to RS-232-C and fiber optics systems; separate buffering for auxiliary support; Int'l keyboards/character sets available	Personal information terminals; features include auto dial, speaker, & graphics char.; Model 415 includes built-in modem; manufactured by Matra (France)	Features emulation of ADDS Viewpoint, Hazeltine Esprit, Lear Siegler ADM 3A, and DEC VT52; features 31-char- acter line drawing set

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Visual 55	Visual 102	Visual 300	Visual 383	Visual 500
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. See comments	Stand-alone — No No Std. DEC VT100/VT102/ VT52	Stand-alone — No No Std. ANSI X3.64	Stand-alone — No No Std. Burroughs TD830	Stand-alone — No No Std. See comments
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1 page 24 x 80 plus status line 12 Std. 128 ASCII 7 x 9 dot matrix White; P31 green opt. No Std. Std. Std. No Std. No Std. No Std. No Std. Both std. Std. Std. No Std. Std. Std. Char./line/screen std.	1920 1 page 24 x 80, 24 x 132 14 Std. 128 ASCII 7 x 9 dot matrix P31 green std. No Std. Std. Std. No Up/down/smooth Std. Std. Std. No Std. Fwd./back std. Std. Std. Char./line/screen std.	1920 8 pages 24 x 80 plus status line 12; 14 opt. Std. 128 ASCII + 64 grph. 7 x 9 dot matrix P4 white std., P31 green opt. No Std. Std. Std. No Up/down/smooth 1 std.; 8 opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Std.	1920 1 page 24 x 80 14 Std. 128 ASCII 7 x 11 dot matrix P31 green No Std. Std. Std. Std. Split screen 6 pages std. Std. — Std. Std. Fwd./back std. Std. Std. No	2640 1 page 33 x 80 plus status line 14 Std. 128 ASCII 10 x 17 dot matrix P39 No Std. Std. Std. Std. No Std. No Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. No Std.	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter 128 ASCII Std. 12 std. Std.	Typewriter 128 ASCII Std. 8 std. Std.	Typewriter 128 ASCII Std. 12 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	No No Std. Opt. Graphics card opt.	No No No Opt. —	No No No Std. No	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ANSI ASCII 50-19,200 Char./line/block No RS-232-C; 20mA opt. No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Character No RS-232-C; 20mA opt. No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C; 20mA No No	Half-duplex Async./sync. ASCII ASCII 50-19,200 Character Pollable RS-232-C, TDI No No	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C, 20mA std. No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 845 — — 11/82 1/83 Visual Technology	— — 1,095 — — 5/83 Visual Technology	— — 1,150 — — 9/81 Visual Technology	— — 1,695 — — Visual Technology	— — 2,495 — — 8/82 9/82 2,000 (1/83) Visual Technology
COMMENTS	Emulations include: ADD5 Viewpoint, Hazeltine Esprit, Lear Siegler ADM- 3A, and DEC VT52; features character line drawing set	Tektronix graphics option allows emulation of Tek- tronix 4010 and 4014	Block graphics & 16 line drawing char- acter set std.; menu-style setup	Compatible with Burroughs poll/ select protocol	Emul. incl.: Hazel- tine 1500, Data General Dasher 200, Lear Siegler ADM-3A, and DEC VT52; In graph. mode Tek- tronix 4010, 4014 is code compatible with raster size of 768 x 585 pixels (¾ scale)

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Visual 550	Western Union Video 100	Westinghouse Canada Model 1625	Westinghouse Canada Model W1640	Westinghouse Canada Model W1640 VIP Dual
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. See comments	Stand-alone 1 No No Std. —	Either 48 No IPARS Opt. Honey. VIP7700, Uni- scope 100/200 opt.	Either 48 No No No Honey. VIP7700, Uni- scope 100/200 opt.	Either; sw. select. 322 No No No Honey. 7700/7800
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2640 1 page 33 x 80 plus status line 14 Std. 128 ASCII 10 x 17 dot matrix P39 No Std. Std. Std. Std. Std. No Std. No Std. No Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	960, 1920 — 12 x 80, 24 x 80 12 No 64; 95 opt. 5 x 7 dot matrix P4 white std. No Std. No No No Up std. No No Addressable opt. No No No No No No No No	1920 80/24/1;3/5 pp. opt. 24 x 80 12 Opt. 126 ASCII; 254 opt. 5 x 7 dot matrix P31 green std. No Field std. Field std. Field opt. Std. Field opt. No Up/down std. 1st; 3/5 opt. No Both std. Std. Std. 2 opt. Fwd./back std. Std. Std. Char./line/screen std.	1920; 2000 opt. 80/25/1; multi opt. 24 x 80 plus status line 12 Opt. 94 ASCII + opt. 5 x 7/7 x 9 dot P31 green std. No Field std. Field std. Field std. Std. Opt. No Opt. Opt. Opt. Add. std.; Read opt. Std. Std. Std. 2 opt. Fwd./back std. Std. Std. Char./line/screen std.	1920, 2000 1920/24/1;3 24 x 80, 25 x 80 12 Tilt,swivel,hgt.opt. 94 + 11 graphics 5 x 7 P31 green std. No Std. Std. Std. No No; std. (7800) No No; up/down std. No No Both std. Std. Std. No Fwd./back tab std. Std. Std. Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 12 std. Std.	Typewriter 64 ASCII No No Opt.	Typewriter 126 ASCII Std. 7 std.; up to 19 opt. Std.	Typewriter 94 ASCII Std. 7 std.; up to 19 opt. Std.	Typewriter 128 ASCII Std. 6 std.; 17 std. (7800) Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	10/30/120 impact No No Std. Cassette tape drive	30-60 cps impact No Opt. Std.; Aux opt. —	30-60 cps impact No No Std. —	No No No RS-232-C std. Opt. cluster con- troller, W1654
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII 50-19,200 Char./line/block No RS-232-C, 20mA std. No No	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Character No RS-232-C No No	Half/full-duplex Async./sync. Various opt. ASCII 50-9600 Blk.std.;char./ln. Std. RS-232-C; 20mA, party line opt. No No	Half/full-duplex Synchronous Honey., Univac opt. ASCII Up to 9600 Block Std. RS-232-C; party line opt. No No	Half/full-duplex Synchronous Honeywell VIP ASCII Up to 9600 Block/line (7800) Std. RS-232-C; 5-cond. party line No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 2,695 — — 4/82 5/82 3,000 (1/83) Visual Technology	53 — 325-350 — 15 8/75 12/75 7500 Western Union	— — 2,600 650 Contact vendor 6/76 11/76 8000 WCI, third party	— — 2,800 1,565 Contact vendor 2/80 1/81 1800 WCI, third party	— — 3,065 (U.S.) 1,500 (U.S.) — — 2/83 WCI, third party
COMMENTS	Alphanumeric code compatible to DEC VT100 and ANSI X3.64. in alpha graphics mode Tektronics 4010, 4014 is code compatible with raster size of 768 x 585 pixels (¾ scale)	Built by Lear Siegler as ADM 3/3A; quantity discounts available	A base design CRT which can be sup- plied with customer firmware & I/O con- figured to meet specific customer requirements	A base design CRT which can be sup- plied with customer firmware & I/O con- figured to meet specific customer requirements	In cluster opera- tion, from 1 to 7 printers may be shared by terminals for local printing without communica- tion to the host

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Westinghouse Canada Model W1642	Westinghouse Canada Model W1643	Wyse WY-50/WY-75	Wyse WY-100	Wyse WY-200
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Either 48 No IPARS Opt. Univac UTS 20, Uni- scope 100	Either 48 No SDLC Opt. Honeywell VIP 7700, Uniscope 100	Stand-alone 1 No No Std. ANSI X3.64 (WY-75)	Stand-alone 1 No No Std. —	Stand-alone 1 No No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 80/25/1; multi-opt. 24 x 80 plus status line 12 Opt. 94 ASCII + opt. 5 x 7/7 x 9 dot P31 green std.	2000 80/25/1 24 x 80 12 Opt. 512 5 x 7 dot matrix P31 green std.	1920 1 page std. 24 x 80, 24 x 132 12 Std. 128 ASCII 8 x 10 dot matrix Green	1920 1 page std.; 2 opt. 24 x 80 plus 2 status lines 12 Std. 128 ASCII 8 x 10 dot matrix Green	2080, 3432 32K 24 x 80/132 plus 2 status lines 14 Std. 256 (ASCII & spec.) 8 x 10 dot matrix Green
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 94 ASCII Std. Up to 32 user-de- fined Opt.	Typewriter 94 ASCII Opt. 24 Std.	Typewriter ASCII Std. 8 std. Std.	Typewriter ASCII Std. 8 std. Std.	Typewriter ASCII Std. 8 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	30-60 cps impact No No Std. Credit card reader, embedded numeric pad w/calculator functions	30-60 cps impact No No Std. Card reader	No No No Std. —	No No No Std. —	No No No Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half std.; full opt. Async./sync. Various opt. ASCII Up to 9600 Block Std. Party line; RS-232-C opt. No No	Half/full-duplex Synchronous SDLC EBCDIC To 19.2K Block Std. RS-232-C, party line No No	Half/full-duplex Asynchronous ASCII/TTY ASCII 50-38.4K Char./block No RS-232-C std., 20mA opt. No No	Half/full-duplex Asynchronous ASCII/TTY ASCII 50-9600 Char./block No RS-232-C std., 20mA opt. No No	Full-duplex Async./sync. TTY ASCII Up to 19,200 Char./block No RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 2,400 425 Contact vendor 5/80 3/81 2300 WCI, third party	— Included in terminal Contact vendor — — 9/83 3/84 — WCI, third party	— — 695-795 — — 9/83 11/83 — Wyse Technology	— — 995 — — 10/81 12/81 — Wyse Technology	— — 1,295 — — — — Wyse Technology
COMMENTS	A base design CRT which can be sup- plied with customer firmware & I/O con- figured to meet specific customer requirements	Can be supplied with customer firmware and I/O configured to meet specific customer requirements	Non-volatile memory standard		

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Wyse WY-300	Xerox 1330	Zenith Z-19-FC	Zenith Z-29	Zenith ZTX-1
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. Wyse WY-100	Either 1 No No Std. XCS network	Stand-alone 1 No No Std. ANSI, DEC VT52	Stand-alone 1 No No Std. ANSI & DEC VT52	Stand-alone 1 Yes No Std. DEC VT52
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1 page std. 24 x 80 plus 2 status 12 Std. 128 ASCII+graphics 7 x 10 dot matrix Color screen 8 colors std. Std. Std. Std. No Std. No Std. No Std. No Std. 2 std. Std. Addressable only Std. Std. Std. Std. Std. Std. Line/page/field std.	1920 2 pages 24 x 80 12 No 128 ASCII 9 x 11 dot matrix P4 white std. No Opt. Opt. Opt. Opt. No No Both std. No No Std. Std. Std. Char./line/screen std.	2000 2000 char. 24 x 80 plus 25th user line 12 No 95 ASCII + 33 graph. 5 x 7/5 x 9 dot P31 green std.; P4 white opt. No Std. Up/down std. No Std. Both std. No No Fwd. std. Std. Std. Char./line/screen std.	2000 — 24 x 80 plus 25th user line 12 Yes 128 (91 ASCII + 33h) 5 x 7 dot matrix P31 green No Std. Std. Std. No Std. Both std. Std. No Std. Std. Std. Std.	2000 — 25 x 80 12 No 128 ASCII 8 x 10 dot matrix P31 green No No Std. No No Std. Addressable only No Yes No Std. Std. Std. Line/page std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter ASCII Std. 8 std. Std.	Typewriter 128 ASCII No 9 std. Std.	Typewriter, data entry ASCII No 8 std. Std.	Typewriter ASCII Std. 9 Std.	Typewriter 128 ASCII Std. 4 std. No
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	No No No Opt. —	No No No Std. Auto-dial modem	No No No No —	No No Std. Std. —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous TTY ASCII 50-19,200 Char./block No RS-232-C No No	Either Asynchronous ASCII/TTY ASCII 50-9600 Line/block No RS-232-C, 20mA No No	Half/full-duplex Asynchronous ASCII ASCII 110-9600 Char./block No RS-232-C No No	Half/full-duplex Asynchronous DC1-DC3 ASCII ASCII 75-19,200 Char./block — RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII 110-2400 Character No RJ-11C, RF-12C, RJ-13C RS-232-C Std. —
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,295 — — — — — Wyse Technology	102 — 950 — 30 11/79 11/79 1000 Western Union	Contact dealer — 999 — — 6/79 — Zenith Data Systems	— — 849 — — 1/83 — Zenith Data Systems	— — 449 — — 4/82 — Zenith
COMMENTS			Available in kit version as Heathkit H-19A-\$695; 90-day on-site service under warranty; follow-on service contract available; 300 Zenith svc. ctrs.; 75 Heath- kit elec. ctrs.	Emulates: DEC VT 100, Lear Siegler ADM-3A, Hazeltime 1500; includes: power-up diagnostics; on- screen configura- tion; subscript/ superscript; screen saver feature	Stores up to 26 names and telephone numbers; The Source Dow Jones, Compu- serve, Compu-Store account numbers pro- vided; can be used as telephone

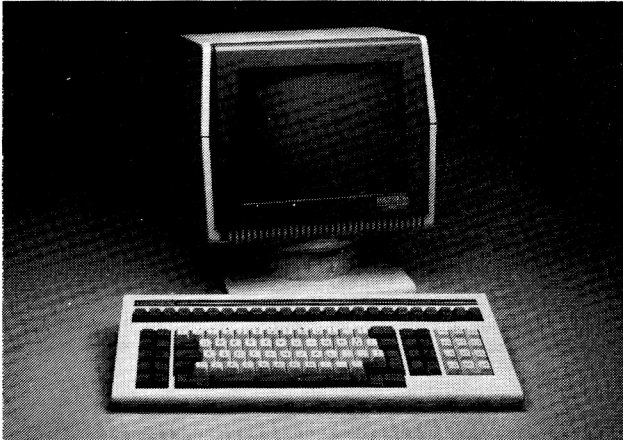
Alphanumeric Display Terminals

SUPPLIER AND MODEL	Zenith ZTX-10	Zenith ZTX-11	Zentec 1021	Zentec 1041	Zentec 1051
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 Yes, case No Std. DEC VT52	Stand-alone 1 Yes, case No Std. DEC VT52	Stand-alone — — No Std. —	Stand-alone — — No Std. ANSI X3.64, Lear Siegler .DM 31	Stand-alone — — No Std. —
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 — 25 x 80 12 Opt. 128 ASCII 8 x 10 dot matrix P31 green No No Std. No No Std. No No No Std. No No Std. Addressable only No Yes No Std. Std. Std. Line/page std.	2000 — 25 x 80 12 Opt. 128 ASCII 8 x 10 dot matrix P31 green No No Std. No No Std. Addressable only No Yes No Std. Std. Std. Line/page std.	2000 — 25 x 80 12 Std. 128 7 x 9 dot matrix P31 green std; white, amber opt. No Std. Std. Std. Std. — — Std. Both std. Std. — Fwd./back std. Std. Std. Char./line/screen std.	2000 2 pages 25 x 80 12 Std. 128 7 x 9 dot matrix P31 green std; white, amber opt. No Std. Std. Std. Std. Up/down std. 2 pages std. Std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.	3300 16K 25 x 80, 25 x 132 12 Std. 128; 256 opt. 9x12/7x12 dot matrix P31 green std; white, amber opt. No Std. Std. Std. Std. — — Std. Std. Std. Std. Smooth std. 4 pages std. Std. Std. Std. Std. Fwd./back std. Std. Std. Std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 4 std. No	Typewriter 128 ASCII Std. 4 std. No	Typewriter ASCII Std. 4 std. Std.	Typewriter ASCII Std. 8 std. Std.	Typewriter ASCII Std. 16 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Std. Std. —	No No Std. Std. —	No No No Std. No	No No No Std. No	No No No Std. No
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format, character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII 110-9600 Character No RS-232-C No —	Half/full-duplex Asynchronous ASCII ASCII 110-9600 Character No RS-232-C Std. —	Half/full-duplex Asynchronous ASCII ASCII To 19.2K Char./block std. Std. RS-232-C No No	Half/full-duplex Asynchronous ASCII ASCII To 19.2K Char./line/block std. Std. RS-232-C, RS-422 No No	Half/full-duplex Asynchronous ASCII ASCII To 19.2K Char./line/block std. Std. RS-232-C, RS-422 No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 399 — — 4/83 5/83 — Zenith	— — 479 — — 4/83 5/83 — Zenith	— — 650 — Contact vendor 6/83 11/83 — Zentec	— — 1,095 — Contact vendor 6/83 11/83 — Zentec	— — 1,295 — Contact vendor 6/83 1/84 — Zentec
COMMENTS	Stores up to 26 names and telephone numbers; The Source, Dow Jones, Compu-serve, Compu-Store account numbers provided; can be used as telephone	Stores up to 26 names and telephone numbers; The Source, Dow Jones, Compu-serve, Compu-Store account numbers provided; can be used as telephone	Includes 32 graphics characters	Includes user set-up mode with non-volatile memory, 32 graphics characters	RAM expandable to 64K; 32K standard

Alphanumeric Display Terminals

SUPPLIER AND MODEL	Zentec 8031				
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — — No Std. —				
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2000 16K 25 x 80 12 Std. 128 7 x 9 dot matrix P31 green std; white, amber opt. No Std. Std. Std. Std. Std. No Up/down std. 2 pages std. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Char./line/screen std.				
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter ASCII Std. 16 std. Std.				
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. No				
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format: character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII To 19.2K Char/line/block std. Std. RS-232-C, RS-422; 20mA opt. No No				
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,150 — Contact vendor 1/83 10/83 — Zentec				
COMMENTS					

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Datastream Communications, Inc. has introduced IBM-compatible display terminals for attachment to Datastream terminal controllers. The 878-15 Display Station, shown here, emulates the IBM 3278 Models 2, 3, 4, and 5; it also provides DEC VT100 emulation.

The following pages provide information on 34 display terminal models from 12 vendors. In this addendum, we have included information on the product lines of three vendors (Comterm, Cybernex, Datastream, and Telegenix) who were not covered in the original feature report, Alphanumeric Display Terminals (C25-010-101), published in December 1983. Most of the remainder of the terminals included in this report were introduced by the vendors after the publication of Alphanumeric Display Terminals. For a comprehensive overview of the alphanumeric display terminal market, see Report C25-010-101.

For your convenience, we have listed below the full names, addresses, and telephone numbers of all 12 vendors whose

products are listed in this addendum. Please note that some of these vendors are also listed in the original report.

Beehive International, 4910 Amelia Earhart Drive, Salt Lake City, UT 84125. Telephone (801) 355-6000.

CIE Terminals, (subsidiary of C. Itoh Electronics), 2505 McCabe Way, Irvine, CA 92714-6297. Telephone (714) 660-1421.

Comterm Inc., 545 Ave. Delmar, Pointe Claire, Quebec, Canada H9R 4A7. Telephone (514) 694-3030.

Cybernex Limited, 1257 Algoma Road, P.O. Box 9086, Ottawa, Ontario, Canada K1G 3T8. Telephone (613) 741-1540.

Datastream Communications, Inc., 2520 Mission College Boulevard, Santa Clara, CA 95050. Telephone (408) 986-8022.

Digital Equipment Corporation (DEC), 146 Main Street, Maynard, MA 01754. Telephone (617) 897-5111.

International Business Machines Corporation, Old Orchard Road, Armonk, NY 10504. Contact your local IBM representative.

Kimtron Corporation, 2225-I Martin Avenue, Santa Clara, CA 95050. Telephone (408) 727-1510.

Lear Siegler, Inc., Data Products Division, 901 East Ball Road, Anaheim, CA 92805. Telephone (714) 774-1010.

Liberty Electronics USA, 625 Third Street, San Francisco, CA 94118. Telephone (415) 543-7000.

Paradyne Corporation, 8550 Ulmerton Road, Largo, FL 33540. Telephone (813) 530-2000.

Telegenix, Inc., 26 Olney Avenue, P.O. Box 5550, Cherry Hill, NJ 08034. Telephone (609) 424-5220. ➤

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SUPPLIER AND MODEL	Beehive ATL-004	CIE Terminals CIT-500	Comterm 5278	Comterm 5279	Cybernex XL-D200
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. ANSI X3.64; DEC VT100	Stand-alone — No No Std. DEC VT100; ANSI X3.64	Cluster 32 No 3278 No —	Cluster 32 No 3279 No —	Stand-alone — No No Std. Data General D200
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2160, 3564 1 page 27 x 80/132 14 Std. 512 7 x 9 dot matrix P31 green No Std. Std. Std. Std. Std. Std. Std. 1 std. Std. Both std. Std. Std. No Std. Std. No Line/page/screen std.	5120 66 x 80 15 (vertical) Std. 256 7 x 9 dot matrix P39 green No Std. Std. No Std. Std. No Std. Both std. No No Std. Std. Std. Std. Std.	960-3564 12/24/32/43 x 80; 27 x 132 15 Std. 94 Various dot matrix P39 green No Std. Std. Std. No No Std. No Addressable only Std. Std. No Std. Std. No No Char./line/screen std.	1920, 2560 24/32 x 80 14 Std. 94 Dot matrix Color (B22) 4 or 7 colors Std. Std. Std. Std. No No Std. Addressable only Std. Std. No Std. Std. No No Char./line/screen std.	1920 1920/24/1 24 x 80 14 Opt. 128 ASCII 7 x 9 dot matrix P31 green No Std. Std. No Std. Std. No Up std. No Both std. No No No No No No Screen, end of line std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Yypewriter ASCII Std. 8 std. Std.	Typewriter ASCII Std. 4 std.; up to 41 programmable Std.	Typewriter, typewr./ APL, data entry EBCDIC, APL Std. 12 std. Std.	Typewriter, typewr./ APL, data entry EBCDIC, APL Std. 12 std. Std.	Typewriter 96 ASCII Std. 20 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	50-19.2K bps 50-19.2K bps No Std. —	200 cps dot matrix — No Std. Audible alarm, key- board numeric lock, light pen	200 cps dot matrix — No Std. Audible alarm, key- board numeric lock, light pen	No No No RS-232-C printer std No
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	half/full-duplex Asynchronous ANSI X3.64 ASCII 50-19,200 Char./block No RS-232-C std.; 20 mA, RS-422 opt. No No	Half/full-duplex Asynchronous ASCII/ANSI ASCII 50-19,200 Character No RS-232-C; 20 mA No No	Half-duplex Synchronous BSC/SDLC EBCDIC 1200-19,200 Block Std. RS-232-C No No	Half-duplex Synchronous BSC/SDLC EBCDIC 1200-19,200 Block Std. RS-232-C No No	Half/full-duplex Asynchronous — ASCII 110-19,200 Character No RS-232-C, 20 mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,195 — — 5/83 7/83 — Beehive & Western Union	— — 2,150 — — — — — Western Union	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 1982 1982 — Comterm	Contact vendor Contact vendor Contact vendor Contact vendor Contact vendor 1982 1982 — Comterm	— — 1,295 — — 2/82 5/82 200 Cybernex
COMMENTS		Full-page word pro- cessing terminal; compatible with Word 11, Lex 11, & WordStar software	Attaches to 5270 Controller; French function keys	Attaches to 5270 Controller; French function keys	Print page; print form; screen blink on/off

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SUPPLIER AND MODEL	Cybernex XL-87H	Cybernex XL-84	Cybernex MDL-120	Cybernex MDL-150	Cybernex MDL-B4E
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone No No Std. Hazeltine 1510/1520	Stand-alone No No Std. —	Stand-alone No No Std. —	Stand-alone No No Std. —	Stand-alone No No Std. MAI Basic Four 7230/ 7240/7250/7260
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1920/24/1 24 x 80 14 Opt. 128 ASCII 7 x 9 dot matrix P31 green No No Std. No Std. No No Up std. 1 std. No Both std. Std. Std. No Field Std. Std. Char./line/screen/ field	1920 1920/24/1 24 x 80 12 Opt. 128 ASCII 7 x 9 dot matrix P31 green No No No No No Up, smooth std. No Both std. No No No Fwd. std. No No Char./line/screen std.	1920 1920/24/2 24 x 80 12 Opt. 128 ASCII 7 x 9 dot matrix P31 green No Std. Std. Opt. Std. Std. No Up/down std. 2 std. No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 1920/24/1 24 x 80 12 Opt. 220 ASCII/special 7 x 9 dot matrix P31 green No Std. Std. Opt. Std. Std. No Up/down std. No No Both std. Std. Std. 32 std. Fwd./back std. Std. Std. End/beginning line/ page, full page	1920 1920/24/1 24 x 80 12 Opt. 128 ASCII 7 x 9 dot matrix P31 green No No No No Std. No No No No No Addressable only Std. Std. No Fwd. No Std. Line/page/form std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 96 ASCII Std. Fixed sequences Std.	Typewriter 96 ASCII Std. No No	Typewriter 128 ASCII Std. 10 std., 16 opt. Std.	Typewriter 96 ASCII Std. 10 std. Std.	Typewriter 128 ASCII Std. 9 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No RS-232-C std. —	No No No RS-232-C printer —	No No Opt. RS-232-C printer —	No No Opt. RS-232-C/Centronics Touch screen	No No No RS-232-C, parallel —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous Xon/Xoff ASCII 110-19,200 Char./block No RS-232-C, 20 mA No No	Half/full-duplex Asynchronous Xon/Xoff ASCII 110-19,200 Character No RS-232-C, 20 mA No No	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./block No RS-232-C, 20 mA No No	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./line/block No RS-232-C, 20 mA No No	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./block No RS-232-C, 20 mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 985 — — 3/82 6/82 100 Cybernex	— — 895 — — 10/79 1/80 10,000+ Cybernex	— — 1,345 — — 10/80 1/81 500 Cybernex	— — 1,475 — — 1/81 4/81 550 Cybernex	— — 1,295 — — 5/82 7/82 150 Cybernex
COMMENTS	Hazeltine 1510 emulation with non-buffered printer port functions of 1520; value-added features include: character-by-character blink & reverse; alternate keypad mode		Opt. bilingual keyboard set (English, French); selectable text compression mode; opt. answer-back code; form transmit function for forms creation	Separate data & attribute plane addressability; multiple redefinable logical terminals; extended instruction set; touch screen version available with up to 256 user-definable rectangles (\$2,495)	Print through main to auxiliary port; internal switch-selectable comm. parameters; auto line feed

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SUPPLIER AND MODEL	Cybernex MDL-110	Cybernex APL-100	Cybernex MDL-125	Cybernex XL-87m/XL-87d	Cybernex XM3270
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. —	Stand-alone — No No Std. —	Stand-alone — No No Std. —	Stand-alone — No No Std. —	Stand-alone — No 3178 Std. ANSI X3.64
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	1920 1920/24/1 24 x 80 12 Opt. 128 ASCII 7 x 9 dot matrix P31 green No Std. Std. Opt. Std. Std. No Up std. No No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 1920/24/1 24 x 80 12 Opt. 64 ASCII/full APL 7 x 9 dot matrix P31 green No Std. Std. Opt. Std. Std. No Up std. No No Std. No Std. 2-column Std. Std. Std. End of line/page, full page	1920 1920/24/6 24 x 80 12 Opt. 128 ASCII 7 x 9 dot matrix P31 green No Std. Std. Opt. Std. Std. No Up/down std. 6 std. No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 1920/24/1 24 x 80 12 Opt. 128 ASCII 7 x 9 dot matrix P31 green No No Std. No Std. Std. Up/down std. No No Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 1920/24/1 24 x 80 12 Opt. 96 ASCII 7 x 9 dot matrix P31 green No Std. Std. Std. Std. Std. No Up/down std. 1 std. Std. Both std. Std. Read modified No Fwd./back std. Std. No end of line/screen, line/screen/3270 er.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 128 ASCII Std. 10 std., 16 opt. Std.	Typewriter, APL 96 ASCII Std. No Std.	Typewriter 128 ASCII Std. 10 std., 16 opt. Std.	Typewriter 96 ASCII Std. 3 std. Std.	Typewriter 96 ASCII Std. 24 3270 PF std. No
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No Opt. RS-232-C printer —	No No Opt. RS-232-C prtr., par. —	No No Opt. RS-232-C prtr., par. —	No No No RS-232-C printer —	No No No RS-232-C —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./block No RS-232-C, 20 mA No No	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./block No RS-232-C, 20 mA No No	Half/full-duplex Asynchronous — ASCII 75-19,200 Char./block No RS-232-C, 20 mA No No	Half/full-duplex Asynchronous Xon/Xoff ASCII 110-19,200 Char./block No RS-232-C, 20 mA No No	Half/full-duplex Asynchronous Xon/Xoff ASCII, ANSI X3.64 110-19,200 Block No RS-232-C, 20 mA No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,345 — — 10/80 1/81 1300 Cybernex	— — 1,345 — — 10/80 1/81 275 Cybernex	— — 1,475 — — 1/81 3/81 200 Cybernex	— — 985 — — 1/82(m); 3/82(d) 3/82(m); 5/82(d) 2500(m); 300(d) Cybernex	— — 1,295 — — 9/83 11/83 10 Cybernex
COMMENTS	Opt. bilingual key- board/character set (English/French); selectable text com- pression mode; opt. answerback mode; form transmit func- tion for forms creation	True overstrike; ASCII/APL mode sel- ect; selectable text compression mode; scroll column to column	Opt. bilingual key- board/character set (French/English); selectable text compression mode; opt. answerback mode; form transmit function for forms creation	Opt. bilingual key- board/character set (French/English) & opt. graphics char- acter set (XL-87m); Datapac-compatible terminal (XL-87d)	ASCII 3278 Type 2, 3178 emulator for use with protocol converter; ANSI X3.64 (DEC compat.); 87-key 3278 keyboard extended highlight- ing; local print page/form; remote buffered print

Alphanumeric Display Terminals Addendum

SUPPLIER AND MODEL	Cybernex 1014	Cybernex SA 830	Cybernex SA 7800	Datastream 178	Datastream 878-15
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No No Tektronix 4010/4012/ 4014, ANSI X3.64	Concatenation 15 No No No Burroughs TD 830	Stand-alone 1 No No No Honeywell 7801/7804/ 7814	Either 32 No 3178/3278 Std. DEC VT100	Either 32 No 3278-2/3/4/5 SNA Std. DEC VT100, ANSI X3.64
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	2555-10,220 (zoom) 3358-13,578 (zoom) 35 x 73,70 x 146 14 Opt. 96 ASCII 5 x 7 dot matrix P39 std. No No No No No No No No No No No No No No No No No No No No	1920 30,720 Program selectable 4-96 x 40/80 14 Opt. 96 ASCII 7 x 12 dot matrix P31 green No Std. Std. Std. Std. Std. No Up/down std. Std. Std. Addressable only Std. Std. No Std. Std. Std. Std. End of line/page, full page	2080 5760 + 160 72 x 80 14 Opt. 96 ASCII/11 graphics 8 x 13 dot matrix P31 green No Std. Std. Std. Std. Std. 3 pages Std. Both std. Std. Std. No Fwd./back std. Std. Std. Char./line/screen std.	1920 — 24 x 80 12 Std. 96 7 x 9 dot matrix P31 green std.; amber opt. No Std. Std. Std. Std. Std. No Std. Addressable only Std. Std. No Std. Std. No Char./line/screen std.	1920-3564 — 24/32/43 x 80, 27 x 132 14 Std. 96 7 x 9 dot matrix P39 green std.; amber opt. No Std. Std. Std. Std. Std. No Std. Addressable only Std. Std. No Std. Std. No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter 96 ASCII Std. No Std.	Typewriter 96 ASCII Std. 24 std. Std.	Typewriter 96 ASCII Std. 12 std. Std.	Typewriter (IBM 3278/3290-style) ASCII/EBCDIC Std. 24 std. Std.	Typewriter (IBM 3278/3290-style) ASCII/EBCDIC Std. 24 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No RS-232-C, parallel —	No No Opt. 2 printer ports —	Any Honeywell prtr. Any Honeywell prtr. Opt. RS-232-C —	No No No RS-232-C —	No No No RS-232-C printer —
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous — ASCII, ANSI X3.64 75-19,200 Character No RS-232-C No No	Half-duplex Async./sync. Burroughs ASCII 150-19,200 Line/block Std. RS-232-C, TDI No No	Full-duplex Async./sync. Honeywell sync. ASCII Up to 19,200 Char./line/block Std. (sync.) RS-232-C; 20 mA (async.) No No	Half/full-duplex Sync./async. SDLC/ASCII ASCII/EBCDIC 110-19,200 Char./block Std. RS-232-C No No	Half/full-duplex Sync./async. BSC/SDLC/ASCII/ANSI ASCII/EBCDIC 300-9600 Char./block Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Served by	— — 2,795; APL—2,995 — — 8/82 10/82 150 Cybernex	— — 1,895 — — 3/82 6/82 450 Cybernex	— — 1,895 — — 8/82 10/82 250 Cybernex	— — 975 — — 8/83 10/83 — Datastream	— — 1,800 — — 3/84 4/84 — Datastream
COMMENTS	High resolution graphics (1024x780); supports dot matrix printers for hard copy; draw, undraw, replace, circle, line, rectangle, block clear, grid commands	Centronics parallel port + RS-232-C serial printer port; cable limit 50 feet; all attributes are line attributes	16K print buffer; selectable non- Honeywell print deliver; opt. 7200 mode with teletype keyboard	Attaches to Data- stream 774, 776, 874, or MPC cluster controllers	Attaches to Data- stream 774, 776, 874, or MPC cluster controller

Alphanumeric Display Terminals Addendum

SUPPLIER AND MODEL	Digital Equipment (DEC) VT220	Digital Equipment (DEC) VT240	Digital Equipment (DEC) VT241	IBM 3179	IBM 3180
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone 1 No No Std. VT100/VT52 X3.64	Stand-alone 1 No No Std. VT100/52;ANSIX3.64 Tektronix 4010/4014	Stand-alone 1 No No Std. VT100/52;ANSIX3.64 Tektronix 4010/4014	Cluster 32 No 3270 System No IBM 3279 Models S2A/S2B/2A/2B/2X	Either 32 (1); 9 (2) No 3270/5250 Systems No 3278-2/3/4/5 (1), 5251-11 (2)
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	3168 — 24 x 80; 24 x 132	3168 — 24 x 80; 24 x 132	3168 — 24 x 80; 24 x 132	1920 — 24 x 80	1920-3564 — 24/32/43 x 80, 27 x 132 (1); 24 x 80 (2)
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 Tilt std. 256 7 x 10 dot matrix White; green; amber	12 Tilt std. 256 7 x 10 dot matrix White; green; amber	13 Tilt std. 256 7 x 10 dot matrix Color	14 Std. 96 7 x 14 dot matrix Color	15 Std. 96 7 x 14 dot matrix Green
Color capability Programmable field/char. highlighting via: Underline Blink Blank Bold Reverse Double size Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	No Std. Std. No Std. Std. Std. No No Std. Both std. No Std. 2 std. Std. & program tabs No No Char./line/screen std.	No Std. Std. No Std. Std. Std. No No Std. Both std. No Std. 2 std. Std. & program tabs No No Char./line/screen std.	4 colors Std. Std. No Std. Std. Std. No No Std. Both std. No Std. 2 std. Std. & program tabs No No Char./line/screen std.	7 colors Std. Std. Std. Std. Std. Std. No No Std. Addressable only Std. Std. No Std. Std. No Char./line/screen std.	No Std. Std. Std. Std. Std. No No Std. Addressable only Std. Std. No Std. Std. No Char./line/screen std.
KEYBOARD PARAMETERS Style Character/code set Detachability Program function keys Numeric keypad	Typewriter ASCII Std. 20 std. Std.	Typewriter ASCII Std. 20 std. Std.	Typewriter ASCII Std. 20 std. Std.	Typewriter, data entry, APL ASCII/EBCDIC Std. 24 std. Std.	Typewriter, data entry ASCII/EBCDIC Std. 24 std. Std.
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	30-240 cps impact — Std. Std. —	30-240 cps — Std. Std. —	30-240 cps impact — Std. Std. —	Std. No No Std. Audible alarm, security keylock	Std. No No Std. Audible alarm, security keylock
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface Integral modem Integral acoustic coupler	Half/full-duplex Asynchronous ASCII ASCII/ANSI 75-19,200 Character No RS-232-C; 20 mA; RS-423 No No	Half/full-duplex Asynchronous ASCII ASCII/ANSI 75-19,200 Character No RS-232-C; 20 mA; RS-423 No No	Half/full-duplex Asynchronous ASCII ASCII/ANSI 75-19,200 Character No RS-232-C; 20 mA; RS-423 No No	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC 1200-9600 Block Std. RS-232-C No No	Half/full-duplex Synchronous BSC/SDLC ASCII/EBCDIC 1200-9600 Block Std. RS-232-C No No
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 1,295 — 6 11/83 11/83 — DEC	— — 2,195 — 16 11/83 11/83 — DEC	— — 3,195 — 23 11/83 11/83 — DEC	Purchase only — 2,295 — — 87-135/yr. 3/84 3/84 — IBM	Purchase only — 2,295(1); 2,195(2) — — 87-111(1); 69-105(2) 3/84 5/84(1); 6/84(2) — IBM
COMMENTS	Plain language set-up menu for feature selection in English, French, & German; multinational character set support; multiple language keyboards available; word processing keyboards available	Bit-mapped graphics version of VT220; two graphic protocols: Tektronix 4010/4014 & DEC ReGIS; 800 x 240 pixel screen resolution	Color version of VT240	Modifiable keyboard with removable key caps	Model 1 is part of 3270 Information Display System; Model 2 is part of 5250 Information Display System; modifiable keyboard with removable keycaps

JUNE 1984

Alphanumeric Display Terminals Addendum

SUPPLIER AND MODEL	Liberty Electronics Freedom 200	Paradyne 7811	Telegenix 1602	Telegenix 8024	
TERMINAL DESCRIPTION Stand-alone or cluster Maximum displays/controller Transportability IBM compatibility Teletype compatibility Other compatibility	Stand-alone — No No Std. TeleVideo 950, LSI ADM 31	Stand-alone 1 No Emulation program Std. TeleVideo 910, Lear Siegler ADM 31	Stand-alone 1 Portable case opt. No Std. ANSI X3.64	Stand-alone 1 Castered stand opt. No Std. ANSI X3.64	
DISPLAY PARAMETERS Display capacity, no. of chars. Memory capacity, no. char./lines/pages Screen arrangement, lines x chars./line	1920 4 pages opt. 24 x 80	1920 — 24 x 80	32 2 pages 2 x 16	1920 2 pages 24 x 80	
Screen area, diagonal, inches Tilt/swivel screen Total displayable symbols Symbol formation Character phosphor	12 Std. 128 ASCII & graphics 7 x 9 dot matrix P31 green	12 Std. 128 ASCII 8 x 10 dot matrix P39 green	20.1 Opt. 68 ASCII 16 stroke matrix Neon orange	124.6 Opt. 68 ASCII 16 stroke matrix Neon orange	
Color capability Programmable field/char. highlighting via:	No Std. Std. Std. Std. Std. Std. Std.	No Std. No Reduced std. Std. No No	No No Std. Std. Std. No No	No No Std. Std. Std. No No	
Underline Blink Blank Bold Reverse Double size	Std. Std. Std. Std. Std. Std.	Std. No No Reduced std. Std. No	No Std. Std. Std. No No	No Std. Std. Std. No No	
Scroll Paging Selectable cursor blinking Addressable/readable cursor Protected format Partial screen transmit Split screen/windows Tabulation Character insert/delete Line insert/delete Erase	Std. Opt. Std. Both std. Std. Std. Std. Fwd./back std. Std. Std. Std.	No No Std. Both std. No Std. No No No No Std.	5-way std. 2 std. Std. Addressable only No No 2 std. Fwd. std. No No Char./line/screen std.	5-way std. 2 std. Std. Addressable only No No 2 std. Fwd. std. No No Char./line/screen std.	
KEYBOARD PARAMETERS Style	Typewriter	Typewriter	Typewriter (opt.)	Typewriter (opt.)	
Character/code set Detachability Program function keys	ASCII Std. Std.	ASCII Std. 14 std.	68 ASCII Std. 15 std.	68 ASCII Std. 15 std.	
Numeric keypad	Std.	Std.	Std.	Std.	
ANCILLARY DEVICES Serial printer, type and speed Line printer, type and speed Composite video Port for cust.-supplied devices Other vendor-supplied devices	No No No Std. —	Std. Std. No Std. —	No No No Opt. Ceiling, floor, & wall mounts	No No No Opt. Ceiling, floor, & wall mounts	
TRANSMISSION PARAMETERS Mode Technique Communications protocol Code Speed, bits/second Format; character, line, or block Multipoint operation (pollable/addr.) Terminal interface	Half/full-duplex Asynchronous ASCII ASCII 110-19,200 Char./block No RS-232-C; 20 mA	Full-duplex Asynchronous — ASCII 300-19,200 Character No RS-232-C	Half-duplex (std.) Asynchronous Start-stop ASCII-77 Up to 9600 (13 spds) Character No RS-232-C std.; 20 mA opt. No No	Half-duplex (std.) Asynchronous Start-stop ASCII-77 Up to 9600 (13 spds) Character No RS-232-C std.; 20 mA opt. No No	
Integral modem Integral acoustic coupler	No No	No No	No No No	No No No	
PRICING AND AVAILABILITY Display station, 2-year lease, \$/mo. Controller, 2-year lease, \$/mo. Display station, purchase, \$ Controller, purchase, \$ Monthly prime-shift maint., \$/mo. Date of announcement Date of first production delivery Display units installed to date Serviced by	— — 745 — — 11/83 2/84 — Liberty Electronics, Sorbus	— — 695 — — 3/84 3rd Q/84 — Paradyne	141.00/166.90 Included 3,000 Included 30 2/82 10/82 See comments Telegenix & third party Telegenix offers 60 models—1602 is the smallest; company has installed base of over 10,000 plasma display ter- minals; character size: 1 in. high by .75 in. wide; legi- bility up to 57 ft.	2,665.00/2,695.70 Included 55,000 Included 620 6/82 3/83 See comments Telegenix & third party Telegenix offers 60 models—8024 is the largest; company has installed base of over 10,000 plasma display terminals; character size: 1 in. high by .75 in. wide; legibility at up to 57 feet	
COMMENTS		Attaches to Paradyne's System 8400 and networking multiplexers; func- tions as 3278 via emulation program in 8400; graphics & foreign language characters			

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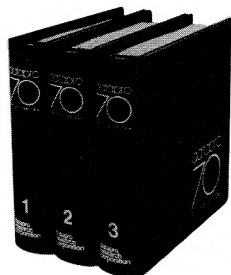
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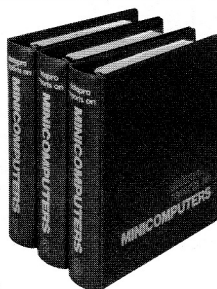
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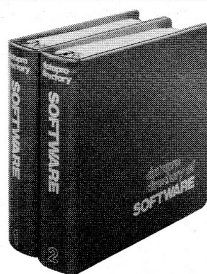


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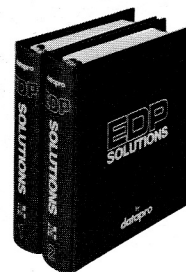


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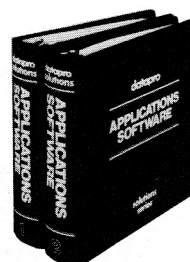


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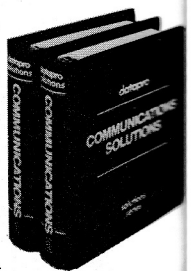


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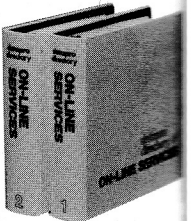
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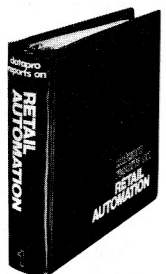


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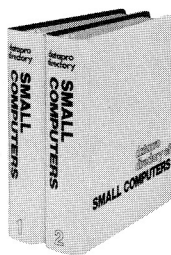
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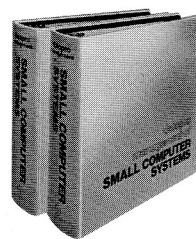
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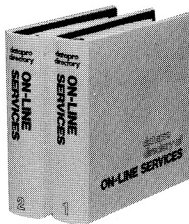
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- User Ratings
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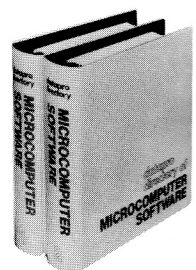
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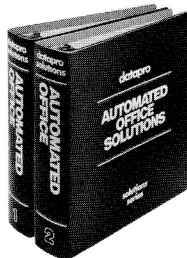
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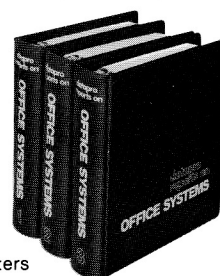


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- Office Facilities
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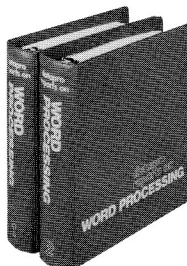


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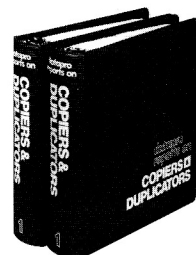
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